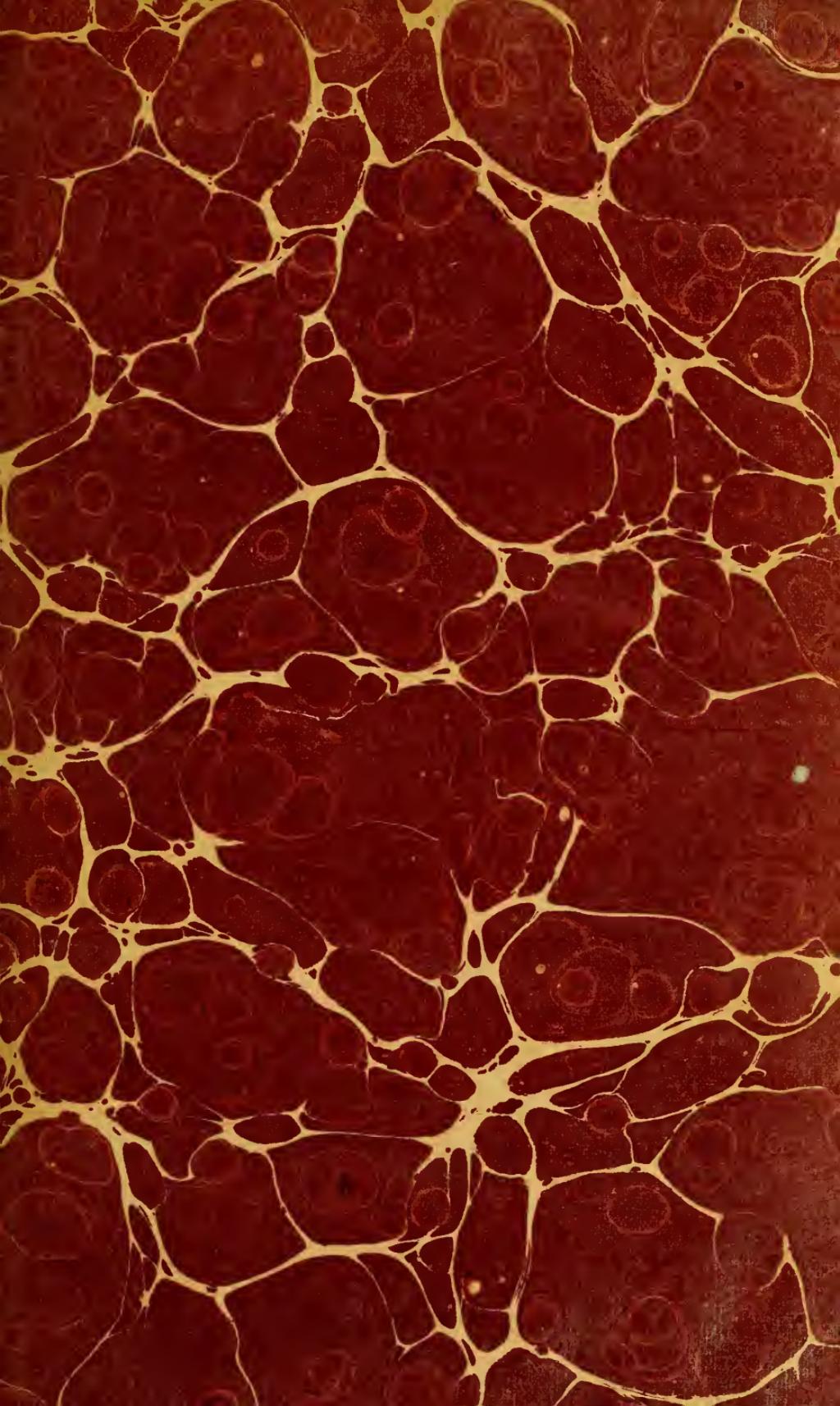


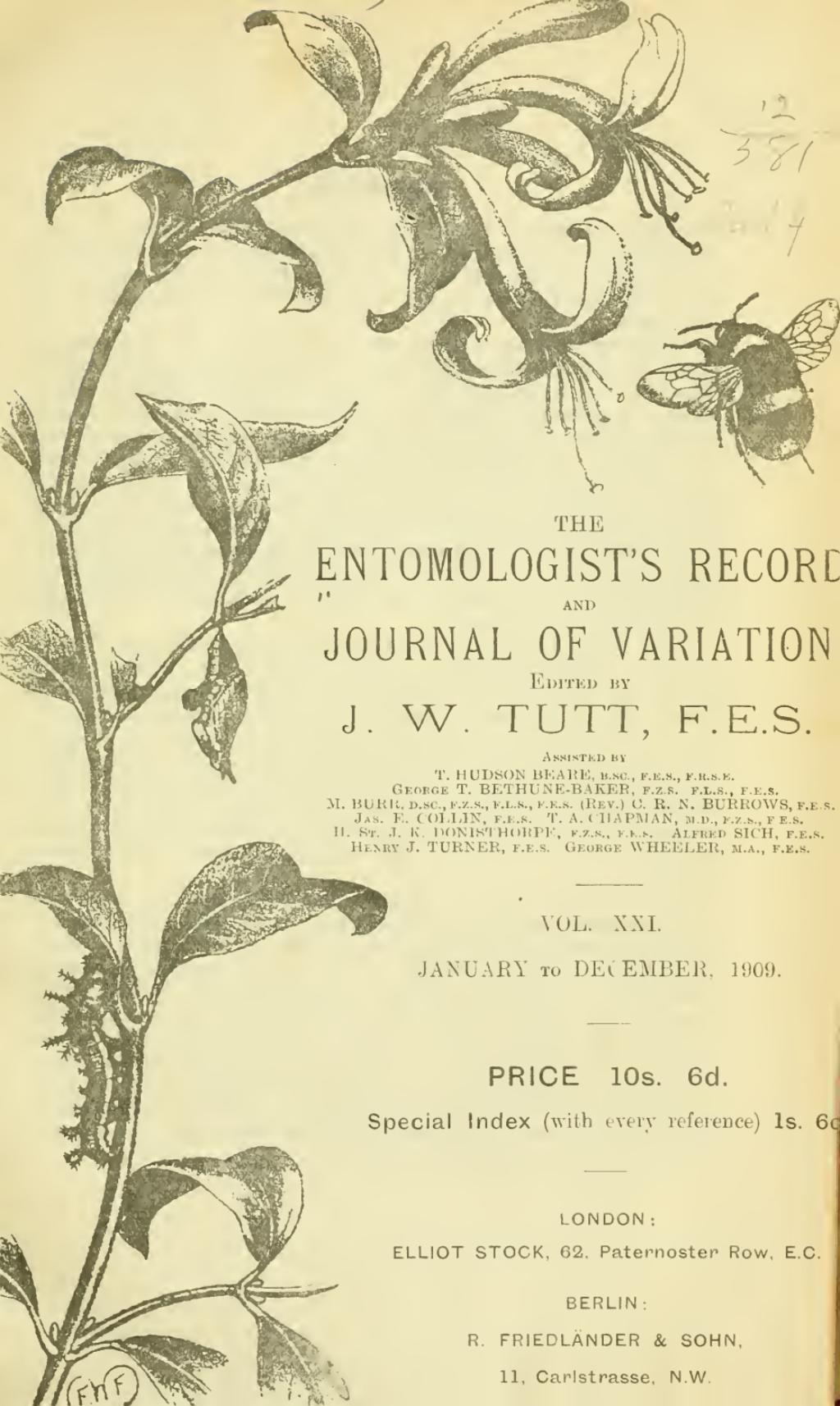


Class QL 461

Book ES 85

SMITHSONIAN DEPOSIT





12
381
7

THE
ENTOMOLOGIST'S RECORD
" AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURKE, D.Sc., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. MONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
HENRY J. TURNER, F.E.S. GEORGE WHEELER, M.A., F.E.S.

VOL. XXI.

JANUARY TO DECEMBER, 1909.

PRICE 10s. 6d.

Special Index (with every reference) 1s. 6d.

LONDON:

ELLIOT STOCK, 62. PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.

F.N.F.

Q2461
E985

PREFACE.

With this number we conclude our Twenty-first Volume, and have to apologise for not having yet been able to carry out our intention of publishing a "coming-of-age" number. It is not for want of the will, but rather that leisure has not been found in which to arrange the details.

The success of the magazine and its position in the entomological world are now so assured that there is no need to point out the varied interests that are catered for. We have been able, thanks to various donors, to present our readers with another extensive series of illustrations, and have no doubt that these have been fully appreciated by our subscribers. We have been fortunate in obtaining a rather larger share of papers relating to British entomology, and would urge our readers to continue to help us in this direction. Articles on field work are still, no doubt, most keenly appreciated, and add largely to our knowledge of "distribution," whilst the notes relating to continental trips in pursuit of our favourite quarry, add largely to our knowledge of the "general" and "local" variation of many species well known to us at home.

The General Index has been again compiled by the Rev. C. R. N. Burrows, whilst Professor T. Hudson Beare, Dr. Malcolm Burr, Messrs. J. E. Collin and H. J. Turner have the special index well in hand. To all of these we offer our most grateful thanks, and, as Mr. H. J. Turner, in particular, really relieves us of a great responsibility in this as well as in other directions, we have obtained his consent to allow his name to appear on the cover of the magazine as one of those to whom we may turn for advice and help when at all necessary. The contents of our magazine will show that our editorial staff is really a working one, to which we owe, and heartily tender, our warmest thanks.

But it is the help of the outsider that really tells; the great mass of short notes, relating to observations in the field, the results of breeding experiments, the record of the rise and fall in the abundance of species in different seasons, the appearance and disappearance of aberrational forms, the extension of species locally under apparently exceptionally suitable conditions, lists of captures from outlying districts, with notes on dates of capture, etc., all add to the general interest of a magazine the contents of which must be to some extent descriptive and biological in their general character. To all those who send us such notes, who introduce our magazine to the notice of their entomological friends, and indeed to all who help us in any way, our best thanks are gratefully tendered.



1



4



2



5



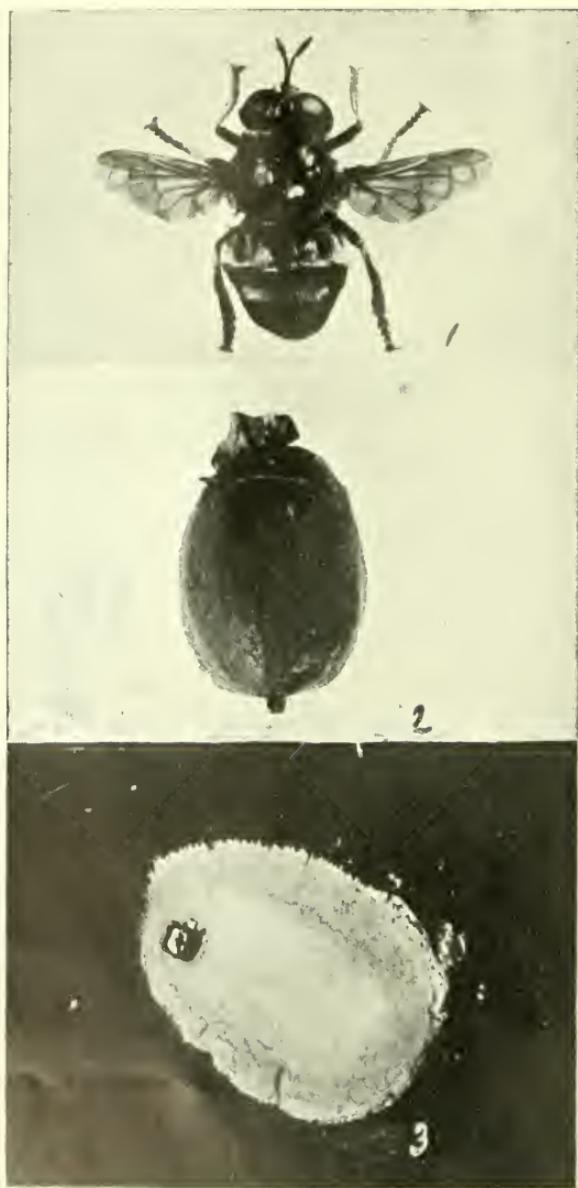
3



6

Photo, F. N. Pierce.

COMPARATIVE VIEW OF GENITALIA OF *Evetria pinicolana*, DBLD. (FIGS. 1, 2, 3),
AND *E. buolianana*, SCHIFF. (FIGS. 4, 5, 6).



LARVA, PUPA AND IMAGO OF MICRODON MUTABILIS, LINN.

The Entomologist's Record AND

JOURNAL OF VARIATION.

VOL. XXI. No. 1.

JANUARY 15TH, 1909.

The Lepidoptera of the Grisons—The Sertig-Thal.

By J. W. TUTT, F.E.S.

The morning of August, 5th, 1908, broke doubtfully at Davos; large heavy clouds hung over the valley, whilst others collected round the highest peaks and presaged rain. However, the sun shone brightly between the cloudy intervals, and a start was made for the Sertig-Thal. Across the valley to Claradel, where more "baths" and "open-air beds" are to be found, and one finds oneself in the Sertig-Thal. This is a much narrower valley than the Dischma-Thal, but almost as highly cultivated, although, as it ascends more steeply, the cultivated patches are more quickly left behind. The abundance of *Odezia (Tanagra) atrata (chaerophyllata)* was most marked; the ♀s principally rested on the grass and other plants in the meadows, but the ♂s were on the wing flying in the sun everywhere. It was, however, a most unusual sight to me to see them busily feeding on the flowers of wild thyme. On the little wild-thyme patches by the edges of the meadows or on the top of the stone-walls, they collected, resting on the flowers with extended and quivering wings, their probosces dug deep into the nectaries of the florets, ever changing their position as they fluttered round a thyme head, successively probing each floret in turn, and then passing on to another, their white-tipped black wings continually vibrating up and down and looking very fresh and fine in the sunlight, and their antennæ extended in front; but they remained when the sun was hidden; on two or three occasions also examples were noticed on the horse-droppings in the road, from which they seemed to be extracting some moisture. *Argynnis aglaja* and *A. niobe* flew joyously up and down the slopes, whilst, on every small piece of waste ground, *Adkinia coprodactyla* was, as in all these neighbouring valleys, readily disturbed. A few examples of *Aricia astrache* and *Polyommatus icarus* were also noticed, whilst *Melampias melampus* flew almost everywhere, nor was there any diminution in the abundance of *Pieris brassicae*, which, in all the valleys of this part of the Grisons this year, amounted to a veritable plague. Hundreds were often in view at one time, half-a-dozen always, even when cloudy or rain was slightly falling. The shadow of two large butterflies (and the specimens were large) would fall in front of one, and a ♀ would be observed flying steadily, and a ♂ a foot or so from her, now above, now behind her, fluttering down to her, and forcing her at last nearer and nearer to the ground. Presently she would settle, and he would follow with quivering wings and take

up a position by her to pair. Immediately her abdomen would be thrown upright into the air, and, whilst he felt for the usual position of the apex of the abdomen, would remain there, lowering and raising it again as often as he receded from or edged up to her. Failing to secure union, he would fly off, and, if she remained still, flew right away, but if she also flew up he would again follow her and go through the whole performance again. The ♂ seems to have no knowledge whatever of whether the ♀ has been fertilised or not. He follows one up for miles, hovering, fluttering, and seeking to charm her; he only finds that pairing is forbidden by failing to find the copulatory organs of the ♀, always held high in the air when he attempts to mate with her. He leaves her simply from failure to effect union. An unpaired ♀ of course leaves her abdomen down and pairing takes place almost immediately, but such a ♀ has of course rarely ever flown, and it is remarkable that natural selection has not yet taught these ♂ butterflies that ♀s on the wing do not require their attention. On the contrary, as many as 7 or 8 ♂s may be seen circling round a single ♀ on the wing, and finally all go disconsolate away. Nor do our common white Pierids ever appear to pair more than once, the ♀s so observed being all in the very finest possible condition. Two ♂ examples of *Merrifieldia tridactyla* (*tetradactyla*) were disturbed, and then a wild patch by the brawling torrent, covered with *Senecio virgaurea*, scabious, centaurea, hieracia, and other wild flowers, showed an abundance of the beautiful *Chrysophanus hippothoë* in both sexes, and the wanted *Loweia subalpina*, but these were neglected for a careful hunt among the *Senecio*, but a good quarter-of-an-hour's search only resulted in a single example of *Fredericina calodactyla* (*zetterstedtii*), work as hard as one might. It was in fine condition, better than any of those taken in the Dischma-Thal on August 1st. It rested in the box with its forewings drawn back about half-way, so as to be almost at right angles with one another, the hindwings covered by the forewings, but with none of the usual stretch of wings almost in a straight line, that one so often sees in the "plumes." On the waste ground, too, we observed a few *Cyaniris semiargus*, usually distinguished on the wing from *Polyommatus icarus*, which was also there, by its darker deeper blue; the ♀s of *semiargus* look particularly black, it always seems to me, on the wing, but I must confess to a difficulty in always discriminating the species readily and well on flight. But in all my wanderings abroad—two species have largely escaped me—*Chrysophanus hippothoë* and *Loweia subalpina*: both have generally been over, quite worn and useless, when I have met them, and my series has usually consisted of a few odd specimens in better condition than the more abundant rejected. Here both were not at all rare, and, although 50 per cent. were rejected, I selected a series of nearly a score of good specimens of each, but this took nearly an hour, as the sun appeared and disappeared, and one could only capture them in the intervals. It is generally stated that *Loweia subalpina* is a form of *L. dorilis*, but this I cannot believe on the superficial evidence of the imagines. The ♀s are very difficult sometimes to distinguish from those of *C. hippothoë* until closely examined. Of course there is no difficulty on close examination. The ♂s of *C. hippothoë* showed none of the purple tinge sometimes so marked in Alpine examples, and the ♀s little or no trace of orange, whilst some of the examples of both

species were exceptionally small, the smallest of *C. hippothoë* about 30mm., of *L. subalpina* 29mm. *Erebia enryale* and *Brenthis amathusia* also appeared, but not in numbers.

Entering the pinewood *Larentia caesiata* flew up in great abundance, and directly one was through it *Parnassius delius* came careering down the slope, whilst many of the big *Pieris brassicae* here looked quite as large. *Adkinia coprodactyla* was disturbed at almost every step, as also was *Enbolia mensuraria* and many Crambids, and a lovely *Plusia* fell to the net, but the rain-clouds were now collecting all over the upper part of the valley, and as Sertig Dörfli came in sight, the rain commenced to descend; we sheltered for a time under a shed and then made for the pinewood; for more than an hour we remained under a pine-tree, perfectly dry, whilst we watched the antics of *Larentia caesiata*, *Enmelesia ericetata*, and *Crambus conchellus*. They defied the rain and required no shelter; over and over again a specimen came to the edge of the pine-tree, flew into the safety of its shelter only an inch or two before returning to the open and rain, with such a speed that suggested that a mistake had been made; but the clouds became denser, and the wet afternoon was certain, so we faced a drenching and stepped out to do the 5 miles to Davos. A warm bath and a change of clothes soon put matters straight, and, if we have little to show for our day's outing, we still have happy memories of our day in the Sertig valley.

Evetria pinicolana, Dbld., specifically distinct from *E. buoliana*, Schiff. (with plate).

By EUSTACE R. BANKES, M.A., F.E.S.

In the *Ent. Mo. May.*, ser. 2, xviii., 209-210 (1907), after giving reasons for my firm conviction, which agrees with the practically unanimous verdict of British lepidopterists, both past and present, that *Evetria pinicolana*, Dbld., is specifically distinct from *E. buoliana*, Schiff., I offered to supply with plenty of material any specialist who would kindly undertake to compare the genitalia, thinking it not improbable that these would afford definite proof that the former insect could not be merely a variety of the latter, as both Meyrick [*HB. Br. Lep.*, 470 (1895)], and Staudinger and Rebel [*Cat.*, pp. 102-3, no. 1851 (1901)], have treated it.

Fortunately for science, my friend, Mr. F. N. Pierce, was good enough to offer his services, and, after various delays, due to our both suffering from bad health, my hopes have been realised beyond all expectation, for, in some named individuals of both sexes of these species that he received from me, Mr. Pierce has found such remarkable and constant differences in the genitalia, not only of the males but also of the females, that they amount to proof positive that *E. pinicolana*, Dbld., is not cospecific with *E. buoliana*. The synonymy, as given by Meyrick (*l.c.*), and by Staudinger and Rebel (*l.c.*), must, therefore, be corrected, so as to show that *pinicolana* is entitled to specific rank.

My hearty thanks are due to Mr. Pierce for the great trouble he has taken in the matter, and for the photographs that are reproduced in the accompanying plate. These indicate clearly, in particular, the striking differences in length and breadth between the genital canals

of the females, and the corresponding differences between the penis-sheaths of the males.

In a future note I hope to record the results of my attempt, made six years ago, to find reliable distinctions between these two species in their larval and pupal stages.

EXPLANATION OF PLATE I.

Figs. 1, 4. Genitalia of ♀ *E. pinicolana* and *E. buoliana*, 'a' being the canal.
 „ 2, 5. Aedeagus (penis-sheath) of ♂ *E. pinicolana* and *E. buoliana*, dissected out.
 „ 3, 6. Genitalia of ♂, with aedeagus ('b') in situ.

Cœnobia rufa, Hw., ab. fusca, n. ab.

By EUSTACE R. BANKES, M.A., F.E.S.

Forewings dark fuscous, somewhat tinged with red. Hindwings dark grey, paler towards the base. The usual black dots on both fore- and hindwings are either visible or traceable. The head, thorax, cilia, etc., are proportionately dark as compared with the type.

I have taken this interesting aberration, which differs from the type in its remarkably dark colour, very sparingly of recent years in the Isle of Purbeck, Dorset, among some hundreds of *Cœnobia rufa*, which have included examples of ab. *pallescens*, Tutt, and ab. *lineola*, Stph., as well as typical specimens and individuals of every intermediate shade between these last and the darkest representatives of ab. *fusca*. Hitherto I have not come across any females approaching the colour of the form under notice, but it would be rash to assume from this fact that ab. *fusca* is confined to the male sex, for, in my experience, females are rarely met with, and of them my captures have only numbered eighteen. It may be mentioned, in passing, that all have been taken at dusk or late dusk, and all, with possibly one or two exceptions, on the wing, and, curiously enough, seven of them were secured on the rather cool and windy evening of August 2nd, 1905, when my total bag of *C. rufa* only included 26 individuals!

I have failed to find any published reference to this extreme form, or to obtain any information of its occurrence elsewhere.

A close acquaintance with *C. rufa*, extending over some years, has convinced me that, in the spots in the Isle of Purbeck where I have found the imago most numerous, the larva must feed in the stems of *Juncus effusus*, though this conviction still awaits the confirmation of positive proof.

Variation of *Aglais urticæ*.

By (Rev.) G. H. RAYNOR, M.A.

Some dozen years or more have now elapsed since my very good friend Mr. W. H. Harwood, of Colchester, drew my attention to the possibilities of this species in the way of variation. Since then I have bred it in large numbers every year, and have also had the privilege of seeing all the remarkable varieties reared by Mr. Harwood. After studying the species for so long a period, I realised about a year ago that it was high time to evolve some order out of the chaos, in the way of arranging the specimens I possessed. With a view to accomplishing this, I did what is absolutely necessary for the successful study of any species, i.e., I got a thorough mental grasp of all the

markings that constitute the "tout ensemble" of the insect, and to each of these I proceeded to assign a Latin name. After all, the markings (liable to vary) are but few and simple. Each of the three large black blotches along the costa of the forewings I have termed a "macula"; the large one in the centre of the inner margin is a "nota"; and to the two smaller ones in the central area the name of "puncta" is appropriately given. The outer margin is naturally termed the "margo," and the blue lunulated spots within it "guttæ." These complete the markings of the forewings. The outer margin of the hindwings also has a black edging which contains blue markings similar to the "guttæ," but which, for the sake of distinction, are here termed "lunulæ." The only other variable portion of the hindwings is the central, red, transverse belt, which at once suggests its parent-word "balteus." If those of your readers who have followed me so far, and wish to understand the accompanying table, will get these Latin names well into their minds, I think they will find but very few difficulties in their way; but, before coming to the "scheme," I should perhaps say that in it "infra" refers to the upper surface of the hindwings, and "subtus" to the underside of the insect; whereas "dorsum" represents the inner margin, and "tornus" the point of junction between this and the outer margin.

In the first place I append an alphabetical list, with full references and descriptions of the 21 (really 20) varieties already described by various authors, only premising that *caschmirensis* = *rizana*, and, having priority, causes *rizana* to disappear.

atrebatensis, Boisd., "Revue et Magasin de Zool.," 1873, p. 409, pl. 17, fig. 1. *Ichnusoides*, South, "Ent.," xxii., p. 218, t. 8, fig. 2. *Urticea* ab., Hb., 549-50; Kirby, "Handbk.," i., 1894, p. 91, fig. 3 (ut ab. a, sed al. post. totis infuscatis)=like *ichnusoides* (of Selys), but with hindwings entirely fuscous. *caerulapicata*, Raynor, "Ent. Rec.," xviii., 298, "with pale chalky-blue apex to forewings." *caschmirensis*, Kollar, "Hügel's Kaschmir.," vol. iv., p. 442 (1844), t. 9, figs. 3, 4; Nicév., "Butts. Ind.," ii., p. 233 (major, obscurior, al. ant. sine mac. caerul.)=a large dusky form, without blue spots on forewings. *chinensis*, Leech, "Butts. China," p. 258, t. 25, fig. 1. Var. *thibetana*, Aust., "Nat.," 1898, p. 201 (major, saturatius fulva, al. margine toto nigro, caeruleo-maculata)=deeper tawny, with entirely black margins, spotted with blue. *conjuncta*, Neub., "Soc. Ent.," xix., 170 (1905).—Agrees in a general way with ab. *atrebatensis*, B., but all three costal blotches are united, forming a continuous black stripe in which not a atom of the ground colour remains. Bred by Dr. Dannenberg in a low temperature. Locality not stated. *connexa*, Butler, "Proc. Zool. Soc. Lond.," 1881, p. 851; Leech, "Butts. China," p. 258 (al. ant. fascia media nigra)=forewings with central black fascia. Tutt, *Brit. Butts.*, 1896, p. 336, says, "A Japanese local form, with the inner marginal spot united with the costal, forming a central transverse band. Almost identical with *polaris*, except for its brighter colour." *dannenbergi*, Neub., "Soc. Ent.," xix., p. 170.—Inclining towards ab. *ichnusoides*, Sél. The blue marginal spots of both forewings and hindwings replaced by spots of a decided straw-yellow colour, those of the hindwings being produced as wedges towards the margin, and with stronger black dusting between them. Underside unicolorous black, the yellow spots forming a broad yellow marginal band. Bred by Dr. Dannenberg. Apparently the result of a temperature experiment. *discolor*, (Hein.), Rühl, "Gr.-Schm.," i., p. 778. "Ground colour dark ochreous-yellow; the blue marginal spots present on both wings; border black. Forewing with three black costal spots, separated by yellowish spots; a white spot beyond the outer black one; a large black spot not far from the inner margin, without a yellowish one beyond it; two black spots in the middle of the wing. Hindwing broadly black at the base; a muddy ochreous-yellow band

between the base and the border. Underside forewing pale ochreous-yellow, with black-brown costal spots. Basal half of hindwing clouded with blackish." Tutt, *Brit. Butts.*, 1896, p. 336, says, "Ground colour not reddish as in the type, but of a dark ochre-yellow."

ichnusa, Bon., "Deser.," t. 3, fig. 2; Dup., i., 23, 4; B., *loc. cit.*, 24, 2; Hb., 840; Tr., x., 1, 21; Rbr., "Ann. S. Fr.," 1832, t. 7, fig. 3 (saturatus fulva, al. ant. mac. duabus med. nullis)=deeper tawny, the two median spots on the forewings being absent.

ichnusoides, Selys, "Cat. Lep. Belg.," 1837, p. 18; "Compt. Rend. Soc. Ent. Belg.," 1874, p. 37; Lambricho, ib., "Ann.," xxi. (1878), p. 9, t. 1, figs. 4, 5 (al. ant. maculisi 2 et 3 costal. conjunctis, mac. med. nullis, subt. obscurior)=second and third costal blotches on forewings coalescing, no median spots; underside more dusky than usual.

ladakensis, Moore, "Ann. and Mag.," (5), i., 1878, p. 227; "Yark. Miss.," p. 2, t. 1, fig. 2; Nicév., "Butt. Ind.," ii., p. 234 (minor, al. fasc. exter. flava; al. ant. sine mac. caerulei.)=a small form, with yellow outer margin; no blue spots on forewing.

nigricaria. de Moffarte, "Miscell. Ent.," Oct. 1, 1895, p. 122, "with black hindwings." Redescribed and figured by Haverkampf, "Anu. Soc. Ent. Belg.," xlviii., p. 186, tab. 1 (1904)=*nigra*, Tutt, *Brit. Butts.*, 1896, p. 335. Hindwings entirely black =*nigrita* Fickert, "Journ. Württemberg Nat. Hist. Soc." (Stuttgart, 1897, p. 68). Hindwings entirely brown-black, with merely slight traces of yellowish marginal spots (Fickert, "Jahresb. Ver. Nat. Württ.," lxxi., pl. lxviii [1897], obviously =*nigra* of Tutt), and is apparently the result of a temperature experiment.

nixa, Grum., "Mém. Rom.," iv., p. 426; Rübl, 354 (mac. caeruleis anter. subnullis, al. post. margine exter. latiore)=forewings with blue spots almost obsolete; hindwings with broad outer margin.

osborni, Donck., "Feuille des jeunes Nat.," xi., p. 33, pl. 1, fig. 4.—Tutt, *Brit. Butts.*, 1896, p. 336, says, "The black costal spots of the forewings, with a broad ochre-yellow edging, form a single long and broad stripe, stretching from the outer margin to the basal area. The outer margin ochre-yellow with black stripes, in which both the small black spots and the upper half of the inner marginal blotch are absorbed. Hindwings brown, with ochre-yellow inner margin. The outer margin of the ground colour, the blue marginal lunules very pale (in the forewings absent)."

polaris, Staud., "Cat.," ed. 2, p. 16. *Urticæ*, Staud., "Stett. e. Z.," 1861, p. 345 (al. ant. mac. dors. cum mac. cost. saepius conjunctis, obscurior)=forewings generally having dorsal and costal spots united. A dusky form.

pygmaea, Rühl, "Gross Schmett. Pal.," i., p. 778—Tutt, *Brit. Butts.*, 1896, p. 336, says, "Small, half-fed examples. This form bears the same relation to *A. urticæ*, that ab. *ioides* does to *l. io.*"

rizana, Moore, "Proc. Zool. Soc. Lond.," 1872, p. 559; Nicév., *loc. cit.*, p. 234 (sequ. var. similis sed major)=similar to the following variety (*caschmirensis*), but larger.

salmonicolor, Raynor, "Ent. Rec.," xviii., 298. "With salmon ground colour." *selysi*, Donck., "Feuille des jeunes Nat.," xi., p. 33, pl. 1., fig. 42.—Tutt, *Brit. Butts.*, 1896, p. 336, says, "Differs from *urticæ* in the smaller size of the inner marginal blotches of the forewings, in the complete failure of the black spots, in the three costal blotches of the forewings not being edged with yellow, in the faintness of the blue lunules in the outer margin of the forewings, and in the complete failure of the same on the hindwings."

turcica, Staud., "Cat.," ed. 2, p. 16; "saturatus fulva,"=deeper tawny. Tutt, *Brit. Butts.*, 1896, p. 335. says, "Intermediate between typical *l. urticæ* and var. *ichnusa* in colour; the inner marginal spot, and two central spots, are absent"=*turcicoides*, Staud.=*urticoides*, Alph., "Iris," vii., p. 303 (eadem cum praecedente, sed duplo minor)=same as preceding (*turcica*) but only half its size.

urticoides, Fisch. v. W., "Ent.," v., p. 123 (1851).—Staudinger says "Forma *pygmaea*"=a small form. Tutt, *Brit. Butts.*, 1896, p. 336, says, "Extraordinarily small (only 29-34 mm.), brilliantly coloured, and somewhat intermediate between var. *turcica* and the type."

In the subjoined scheme, or table, I have analysed, and arranged according to their position, the above-named varieties, placing them in the left column, and opposite to them I have placed 30 aberrations

which I here name and describe for the first time—nearly all from Essex specimens. Of the 24 previously-named forms, the following, at any rate, I know to occur in Britain—*atrebateus*, *caerulapicata*, *connexa*, *discolor*, *ichnusa*, *ichnusoides*, *nigra*, *polaris* and *salmonicolor*, and of the others *nixa*, *pygmaea* and *urticoides* have almost certainly occurred.

AGLAIS URTICÆ.

UPPER-SURFACE.

GROUND COLOUR.

discolor, dark yellow.
salmonicolor, salmon.

alba, white.
brunneo-violacea, brown-violet.
clarirufa, bright rufous.
fulva, reddish fulvous.
ignea, fiery-red.
latericolor, brick-coloured.
lutea, buff.
rubrochrea, reddish-ochreous.
obscura, dull, dusky-red.
polychloroides, of the colour of *poly-chloros*.
testudinea, deep, rich, tortoiseshell.

PRIMARIES.

flavotessellata, with pale yellow central area extending from costa to inner margin.
infuscata, with all the dark markings much intensified.
nubilata, with black, cloudy area between 2nd macula and nota.
radiata, with veins (in central reddish area) much blackened.
strigata, with black, horizontal streak, between 2nd macula and nota.

APEX.

caerulapicata, with pale, chalky-blue apex.

MARGINS.

caschmirensis, without blue lunules.
chinensis, with the black margins blue-spotted.
dannenbergi, with lunules straw instead of blue.
ladakensis, with yellow margins without blue lunules.

COSTA.

nigricostata, with narrow black margin to costa.
fulvomarginata, with outer margins edged with fulvous.
griseomarginata, with outer margins edged with grey.
parriguttata, with small blue lunules.
magniguttata, with large blue lunules.
cuneatiguttata, with wedge-shaped blue lunules.

MACULÆ.

ichnusoides, 2nd and 3rd maculæ coalesce; puncta absent.
atrebensis, 2nd and 3rd maculæ coalesce; hindwings entirely fuscous.
conjuncta, all three maculæ coalesce.
osborni, all three maculæ coalesce, and are edged with yellow-ochre; puncta both absent.
connexa, with complete black median fascia, ground colour normal.
polaris, with complete black median fascia, ground colour dusky.
selysi, with four maculæ (three along costa, fourth square, and near margin).

PUNCTA.

chnusa, puncta both absent, ground colour deep tawny.

NOTA.

turcica, nota (and puncta) absent.

DORSUM.

SECONDARIES.

nigricaria, black.

nixa, with broad outer margin.

SIZE.

pygmaea, small.

urticoides, small (29-34 mm.), brilliantly coloured.

UNDER-SURFACE.

magnipuncta, with large puncta.

parvipuncta, with small puncta.

punctijuncta, with joined puncta.

tripuncta, with three puncta.

unipuncta, with one punctum.

magninotata, with large nota.

parvinotata, with small nota.

nigridorsata, with black streak running from tornus to nota.

adumbrata, with black cloud at top of balteus.

infraradiata, with veins (of hindwings only) much blackened.

angustibalteata, with narrow balteus.

latibalteata, with broad balteus.

magnilunulata, with large blue lunules.

parvilunulata, with small blue lunules.

subtus-lactea, with pale area creamy (instead of ochre).

subtus-rufa, with pale area rufous (instead of ochre).

This tabular arrangement will, I hope, enable specialists to sort out the different forms of this insect they possess, and when they get a representative series I believe they will be convinced that I am not guilty of refinement in assigning such a large number of new names, but that every form named is worthy of separation from the type.

Many of them are both rare and beautiful, notably *alba*, *ignea*, *discolor*, *nigricaria*, *ichnusoides*, *atrebensis*, *conjuncta*, and *caeruleapicata*. It is, beyond all controversy, a most glorious insect, and, according to my experience, maintains its pristine lustre undimmed for many years, provided that it has never been subjected to any chemical fumes. Personally I avoid all such deleterious agents as ammonia and cyanide, and kill by puncturing with a pen-nib steeped in nicotine.

In conclusion, I feel I must heartily thank the Rev. G. Wheeler, Mr. Louis B. Prout, and Herren Standfuss, Federley, and Gillmer, for their valuable assistance in the matter of nomenclature, and may also add that I shall always be pleased to help any of your readers, so far as I can, in matters connected with this species.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.E.S., F.Z.S., etc.

(Continued from vol. xx., p. 260.)

4. DOLICOPODA AZAMI, Sauley.

Differs from its congeners as shown in the table of species. According to Azam, this species occurs in November in various caves and grottos in Provence, as the Grotte des Chauvesouris, near Châteaudouble, in crevices in the Clue de Chabrières, Font de Sao.

5. DOLICHOPODA LINDERI, Dufour.

Testaceous: dorsal segments of thorax and abdomen bordered with fuscous: all femora unarmed beneath: anal segment of male transverse, not toothed. Length of body, 17mm. ♀; of pronotum, 3.8mm. ♀; of anterior femora, 13.5mm. ♀; of middle femora, 13.5mm ♀; of hinder femora, 21.5mm. ♀; of hinder tibiae, 26mm. ♀.

Taken in the Grotto of Villefranche in the eastern Pyrenees, and also at grotto of Conflans near Prades and Limoux, and Grotte des Chauvesouris, near Châteaudouble.

Section III: GRYLLODEA.

This section comprises the crickets, which have long antennæ, and exserted ovipositor in common with the *Locustodea*, and, like that group, produce their song by the friction of the elytra; the manner of the latter, however, differs in detail; they resemble the *Acridiodea* in having three segments in the tarsi, but, as in the preceding group, the auditory organ, which is occasionally absent, is situated in the anterior tibiae. These characters will enable the student easily to recognise even the most bizarre form of cricket, but we may mention, also, the following peculiarities:—

The head is almost invariably rounded, the frons vertical, and separated from the vertex by a narrow, nearly horizontal, rostrum; three ocelli are usually present, in addition to the true eyes. The pronotum is generally simple, square, with reflexed sides.

The elytra are generally truncate at the apex, and are sharply divided into two distinct portions; the anterior portion, when at rest, is placed vertically in a plane at right angles to the dorsal surface; this portion is narrow, and is the least important part of the organ. The venation of this part is not much modified for stridulation; while in the *Locustodea*, this portion is the largest part of the elytra, in the *Gryllodea* it is the smallest; it is the horizontal part which is modified to form a stridulating organ in both groups. In the crickets the modification (in the male at least) is the same in both elytra, and the sound is produced equally by each. The modification is very remarkable, and in order to study it the student is recommended to obtain some fresh specimens of the common house-cricket, which may usually be found in bakeries, if not in all private houses. The homologies of the veins may be picked out with a little care.

The apical part of the elytra is normal.

This modification for stridulation is normally present only in the male, but in *Gryllotalpa* the elytra are very similar in both sexes.

A good many crickets are entirely apterous; in *Trigonidium* the elytra are horny and coriaceous as in the coleoptera.

The wings are often absent, or may be fully developed or abortive in the same species. When present, they are very simple, membranous, delicate, and caudate, that is, the apical part, when folded, projects well beyond the elytra, but, instead of being hardened as in certain *Phaneropteridae*, for example, they are delicate, and probably serve as organs of touch, for the crickets are mostly nocturnal, or inhabitants of holes and narrow burrows.

The feet resemble those of the *Locustodea*, with the exception of the tarsi which have only three segments, as we have seen; in the *Gryllotalpidae* and the *Tridactylidae*, the anterior pair are modified for digging.

The posterior tibiae are only spined above; in addition to the fixed spines, there are apical spines or spurs which have an articulated insertion, and are also pubescent. In *Tridactylidae* they are flattened. The tarsi have two apical spines on the first segment; in *Tridactylus* the tarsi are abortive.

The abdomen is generally cylindrical. The cerci are long and hairy; the subgenital lamina generally carries short styles.

The ovipositor is exserted, long, and slender; it is wanting in the *Gryllotalpidae* and *Tridactylidae*.

It appears that there are about a dozen ecdyses. The larvae

resemble the adults in form, but are smaller, have a soft integument and are apterous.

Copulation is effected by the male creeping beneath the female, introducing a spermatophore, which fertilises the ova as they are laid.

Crickets are omnivorous; they are greedy feeders, and will attack each other, and fight fiercely in captivity; they generally frequent very hot, dry places, or live in holes and burrows, under logs, stones, etc. The male betrays his whereabouts by his shrill, persistent, song, but this ceases directly he is disturbed or frightened.

One European species, *Ecanthus pellucens*, lives on shrubs and trees, and *Myrmecophila* lives in ants' nests. Gilbert White gives interesting notes on our British crickets in his letters to the Hon. Daines Barrington, Nos. 46, 47, and 48.

TABLE OF FAMILIES.

1. Anterior feet formed for walking. Ovipositor exserted.
 2. Posterior tibiae spined above.
 3. Posterior femora very slender. Posterior tibiae with long spines remote from each other, and some dense, small spines ..
 - 3.3. Posterior femora stout; posterior tibiae simply spined, sometimes serrate at the base.
 4. Eyes present; body elongate.
 5. Elytra horny, opaque. Second tarsal segment dilated: ovipositor curved ..
 - 5.5. Elytra more or less membranous and transparent; second tarsal segment cylindrical; ovipositor straight ..
 - 4.4. Eyes absent, body spherical
 - 2.2. Posterior tibiae serrulate above, not spined ..
 - 1.1. Anterior feet fossorial (modified for digging). Ovipositor absent.
 2. Antennae long, with many segments; posterior tibiae dilated, short, spined above; elytra membranous; two cerci; large insects ..
 - 2.2. Antennae short, ten segments; posterior tibiae slender and long, with flattened spines; elytra horny; four cerci; small insects ..

1. **ECANTHIDÆ.**

2. **TRIGONIDHÆ.**

3. **GRYLLIDÆ.**

4. **MYRMECOPHILIDÆ.**

5. **MOGOPLISTIDÆ.**

6. **GRYLLOTALPIDÆ.**

7. **TRIDACTYLIDÆ.**

Family I: **ECANTHIDÆ.**

This includes a number of delicate and slender crickets, occurring in the temperate regions of both hemispheres.

Genus I: **ECANTHUS**, Serville.

Of slender build; posterior femora slender; elytra of male ample and highly modified, of the female narrow and simple.

1. **ECANTHUS PELLUCENS**, Scopoli.

Pale, straw-coloured, with whitish pubescence. Length of body, 9mm.-15mm, ♂, 11mm.-14mm. ♀; of pronotum, 2mm.-2.8mm. ♂, 2.2mm.-2.5mm. ♀; of elytra, 10mm.-15mm. ♂; 9.5mm.-11mm. ♂, of ovipositor, 6mm.-7.5mm. ♀.

Common from the end of July to September in southern, and south-central Europe, on flowers, shrubs, and vines. The most northerly records are Regensburg in Bavaria, Thüringen and Freiburg in Switzerland, and Frahan in the Ardennes. In France it is common

in the south and rarer in the centre, reaching as far north as Paris. It is not common in Austria, and occurs in Bohemia. The record from Norfolk is almost certainly due to mistaken identity.

Family II: TRIGONIDIIDÆ.

This family contains a few curious beetle-like little crickets, with horny, arched elytra; the hind femora are thick right up to the apex; the second tarsal segment is cylindrical.

Genus I: TRIGONIDIUM, Serville.

Small, beetle-like: the only European cricket in which the ovipositor is curved.

1. TRIGONIDIUM CICINDELOIDES, Serville.

Small, dark indigo-blue; hind-legs reddish. Length of body, 4mm. ♂, 6mm. ♀; of pronotum, 1mm. ♂, 1.2mm. ♀; of elytra, 3mm. ♂, 4mm. ♀; of ovipositor, 2.2mm. ♀.

This curious little cricket is easy to recognise by its dark blue-black indigo colour, reddish hind-legs, horny elytra, and curved ovipositor. It is a Mediterranean species. In France recorded from Hyères and Corsica; in Spain, from Malaga, Algeciras, Barcelona, and Minorca; in Italy, at Naples, Brindisi; also in Sardinia and Sicily. Eastwards, it extends into Asia. It may be found in moist places, in swamps, on grass, and reeds.

Family III: GRYLLIDÆ.

This family contains the true crickets; several genera occur in Europe.

TABLE OF GENERA.

1. Hind tibiae unarmed at the base: anterior tibiae with tympanum: Elytra perfect or abbreviated.
 2. Spines of posterior tibiae long, slender, and mobile; first segment of posterior tarsi neither sulcate nor serrate above
 - 2.2. Spines of posterior tibiae fixed and strong; first segment of posterior sulcate above, and sulcate on each side.
 3. Vertex rounded; elytra and wings generally perfectly developed.
 4. First segment of anterior tibiae compressed, longer than the other two combined; anterior tibiae with two internal spurs like spines; ovipositor as long as, or longer than, posterior femora.
 5. More or less hairy; anterior tibiae with tympanum; head more or less depressed
 - 5.5. Hairless; anterior tibiae with no tympanum on front side; head not depressed
 4. First segment of anterior tarsi cylindrical, shorter than the other two; anterior tibiae with two inner spurs dilated; ovipositor very short
 - 3.3. Vertex acute (♀), or produced into a veil-like process; elytra abbreviated; wings absent..
 - 1.1. Posterior tibiae serrate at the base, spined beyond the middle; elytra absent; anterior tibiae with no tympanum.
 2. Elytria distinct in ♂, very small and almost

1. NEMOBIUS, Serv.

2. GRYLLUS, Linn.

3. GRYLLODES, Sauss.

4. BRACHYTRYPES, Serv.

5. PLATYBLEMMUS, Serv.

hidden under pronotum in ♀; pronotum raised posteriorly; 9th dorsal segment ♂ truncate; subanial plate ♂ not compressed.

3. Elytra flat, almost lanceolate, and longer than pronotum, which is somewhat rugose above at the base; middle tibia with four spurs. Colour reddish, or with greyish spots ..

3.3. Elytra convex, rounded; pronotum smooth above; middle tibiae with only three spurs; black or pale

2.2. Elytra absent; pronotum not raised posteriorly; 9th dorsal segment ♂ arched behind; subanial plate ♂ compressed

6. PETALOPTILA, Pant.

7. DISCOPTILA, Pant.

8. GRYLLOMORPHA, Fieb.

Genus I: *NEMOBIUS*, Serville.

This genus contains, in western Europe, three small crickets with short elytra, and long, slender, articulated spines at the apex of the posterior tibiae.

TABLE OF SPECIES.

1. Ovipositor longer than abdomen; elytra ♂ and ♀ not passing third abdominal segment

1.1. Ovipositor shorter than abdomen; elytra scarcely shorter than abdomen in both sexes.

2. Small; posterior tibiae with four spines above on each side

2.2. Large; posterior tibiae with four spines on the inner side above, the first very short, and three on the outer side

1. *SYLVESTRIS*, Fabr.

2. *HEYDENI*, Fisch.

3. *LANCEOLATUS*, Brullé.

1. *NEMOBIUS SYLVESTRIS*, Fabr.

Reddish-chestnut, head black, elytra short and truncate. Length of body, 10mm. ♂ and ♀; of pronotum, 2mm. ♂, 2.5mm. ♀; of elytra, 3.5mm. ♂, 2.5mm. ♀; of ovipositor, 7.2mm. ♀.

The wood-cricket is easy to distinguish from the other two species by the short elytra. It is found under dead leaves in woods; adult in June and July; it is common in central Europe. In England, only known in the New Forest and Parkhurst Forest. In France common everywhere. In Belgium at Coloaster, Chaudfontaine, Huy, Spa, Arlon, Marcinelle, Tennstedt. In north Italy and in Spain fairly common.

Pantel separates this species into a subgenus, to which Bolivar gives the name *Pronemobius*.

2. *NEMOBIUS HEYDENI*, Fischer.

Small, reddish-chestnut; elytra with hinder margin rounded in the ♂, truncate in the ♀. Length of body, 6mm. ♂ and ♀; of pronotum, 1.8mm. ♂ and ♀; of elytra, 4mm. ♂, 3.5mm. ♀; of ovipositor, 2.5mm. ♀.

This little cricket occurs on grass and under stones, and by the banks of streams in southern Europe. It is rare in France, and only known in the south—Cazan near Arcachon la Tests-de-Buch, Saint Médard, Caraman, Chabières, Draguignan, Lorgnes, Bagnols. In Italy it is rare and local, but recorded from Pegli, Benevento. In central and northern Spain at Barcelona, Madrid, and Santander. In the South Tirol at Recoaro and Enganei. Unknown in Germany and northern Austria, but common in the southern Alpine valleys, and all Switzerland.

3. *NEMOBIA LINEOLATUS*, Brullé.

Resembles the preceding, but larger; elytra of ♂ with hind border truncate, with differences in the venation; hind tibiæ with different armature (see table of species); ovipositor crenulate at the apex. Length of body, 9mm. ♂ and ♂; of pronotum, 2mm. ♂ and ♀; of elytra 5mm. ♂, 4.8mm. ♀; of ovipositor, 5.2mm. ♀.

In similar localities to the last, but rarer. In France rare and local, only known in the south; on the banks of the Adour near Saint Sevez, Mont de Marsan in the Pyrenees, on the banks of the Drac near Grenoble, Bagnères de Luchon, in Loire Inférieure, l'Asse near Digne, Bagnols, Saint Paul in Var. In Italy at Pegli, but rare and local.

Azam describes a variety *fabryi*, in which the wings are hyaline with brownish veins, the elytra twice as long, reaching the end of the posterior tibiæ; this variety is based on a female taken at Cellier in the Loire.

(*To be continued.*)

Chrysophanus dispar var. *rutilus*, Wernb., in Hungary.

By THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S.

In the late summer of 1907, I was fortunate enough to see *Chrysophanus dispar* var. *rutilus* in its native haunts in Hungary. The insect is fairly common near the villages of Cséhtelek and Közepes in Bihar Comitat. This beautiful butterfly occurs apparently everywhere in the district where the ground is liable to floods. All along the valley of the small river Bisztra are wet meadows, under water in the spring and nearly dry in the late summer and autumn. They are the great sources of hay in the district, and are mown twice a year and grazed as well. A few docks, not the large *Rumex hydrolapathum*, among the grass, some small plants of *Iris pseudacorus*, and an occasional shallow depression filled with a small reed-like grass, are the characteristic features of these fields. *C. rutilus* flies about rapidly in these meadows, which are very similar to those in the valley of the Nene, between Northampton and Peterborough. The docks, which are all riddled with holes (doubtless due to the larvæ of the butterfly), are so few in number that the insect must have other foodplants, possibly *Polygonum bistorta*, which Aigner* states it eats in Hungary. I also found the insect in an open space in a forest at Cséhtelek where a small brook occasionally overflows its banks. At Közepes, a village in the Réz mountains, a tiny stream trickles out of the forest which clothes the mountains, and, in a small space, under an acre in extent, overgrown with *Eupatorium*, I took some dozen examples of the butterfly. There is a considerable variation in size of the specimens I secured, although they were all taken between August 20th and September 7th. Aigner (*l.c.*) says that specimens of the second-brood are larger than those of the first, but this does not seem to be constant. The smallest male I secured measures 25mm., and the largest 33mm. Females are naturally larger, my specimens ranging from 28mm. to 37mm.

* *Magyarország Lepkéi*, p. 5 (1907).

Notes on *Papilio machaon*.

By CECIL FLOERSHIEM, B.A., F.E.S.

LARVAL HABITS.—The ovum is laid singly, usually on the underside of young growth of *Skimmia* (leaf). Larva hatches any time of day till nightfall, but most often between seven o'clock and eleven in the morning.

I. *Resting-habit when young*.—(1) Fore-segments raised and arched, giving appearance of miniature sea-horse (this is the position adopted when undergoing ecdysis), or (2) fore-segments very slightly raised and not arched; this (2) being the attitude more commonly taken, when young, whilst merely at rest after feeding. In both of these positions the young larva of *Papilio machaon* adheres to its pabulum, by the last three pairs of prolegs and the anal claspers, keeping its thoracic legs tightly shut. On a dull day it is more inclined to adopt resting attitude, and, whilst resting, to keep itself in position (1). I suppose this arched habit is that of complete, the more outstretched one that of partial, rest. I should say that the time given for resting during moult (Tutt, *Nat. Hist. Brit. Lep.*, vol. viii., p. 77) is about the average during fine weather.

The young larva of *P. machaon* when not feeding has a habit of jerking its head violently from side to side at times without apparent cause. It rests (a) usually with its head pointing towards the stem of the leaf, and (b) on the upperside [about 70 per cent. adopting (a) on *Skimmia*, and all (b)]. On fennel also the former habit is noticeable. Even during heavy rain the young larvae will not retreat to the underside of the *Skimmia* leaves, though I have found them drowned in consequence.

II. *Feeding-habit, young*.—(1) On emergence, turns round towards ovum which it gradually devours, seldom pausing in this till the shell is about two-thirds consumed, then wanders off, but always returns to empty shell as if compelled by some imperious necessity, until its last vestiges are done with. (2) Sometimes feeds from edge, sometimes from the middle, of the leaf; eats usually through entire leaf, but sometimes only the upper layer. Feeds on young growths of *Skimmia*, preferably on upperside, even when the ovum has been laid on the underside. (3) Always eats exuviae (*i.e.*, cast skin).

III. *Resting-habit, young*.—(1) On upperside, along the middle of *Skimmia* leaf, clinging by all its prolegs; the thoracic legs being open, not clasped together; stretched out almost at full length, but with thoracic segments slightly arched. When full-fed, or nearly so, it loses its habit of resting with head pointing towards stem of leaf; indeed, by far the greater proportion of those I noticed rested with their heads turned towards the tips of the leaves upon which they were feeding. (2) Also rests on stem of young shoots of *Skimmia* immediately below leaves upon which it has been feeding in same position as described. I should say that the time of one-and-a-half days given (Tutt, *Nat. Hist. Brit. Lep.*, vol. viii., p. 77) for quiescent stage, preceding pupation, is on average short by one day of rest actually taken.

IV. *Feeding-habit, old*.—On upperside of leaf, or on stem of young shoot, devouring the leaves above. Sometimes eats the entire leaf, more often only a large piece out of it. Feeds usually with head

pointing towards tip of leaf, eating right across it, from apex to base. *P. machaon*, both when young and old, will feed from early morning until after sunset, but time for leaving off varies, some continuing to feed long after others have ceased to do so. All its life it consumes its exuviae.

V. *Food-habit*—on *Rutaceae* and *Umbelliferae*.—*Skimmia oblata* (*japonica*) appears to be its favourite food-plant, the imagines in my butterfly-house laying more eggs on this than even the fennel that grows by its side, and the larvae feed up quicker on this than on any other pabulum (the young succulent growths being preferred to the leaves of the year before). Next to this I should place fennel. It will also feed on rue and dittany (*Dictamnus fraxinella*), preferring the aromatic seed-pods of the latter, and on *Ptelea*, but the specimens found on the last-named take at least twice as long to feed up as those on *Skimmia*. I have never found ova or larvae on beaked-parsley or cow-parsnip, though both of these grow in my butterfly-house.

VI. *Sleeping-habit*.—When young, on upperside of leaf, with head generally pointing towards stem and slightly raised, and with thoracic legs clasped—often down the midrib of leaf—in fact, the sleeping-habit is the same as the complete resting-habit, and the larva does not appear to move from its resting-place. On fennel, also, with head pointing inward from tip of leaf towards the main stem. When older, indistinguishable from resting-habit.

VII. *Forward or laggard habit*.—Every summer some one or two per cent. of my *P. machaon* larvae produce a partial second-brood, and in a warm one like the present (1908), as many as five per cent. did so; the imagines appearing from July 30th till August 15th. The pupæ of these were amongst the early-formed ones, but not, in all cases amongst the very earliest. Indeed, out of the twelve first pupæ I found, only two produced second-brood imagines, in spite of my subjecting them to a forcing heat in a viney for more than three weeks. The others lived, but obstinately refused to be forced, whilst others which had pupated a week later gave rise to imagines under natural conditions. From what I have observed, I should say that, though all *P. machaon* larvae which result in a second-brood feed up rapidly, many of those which feed up rapidly do not disclose a second-brood. With regard to the “forward” and “laggard” habit amongst the larvae themselves, there is a great variety in the time taken to feed up, the last larvae, though resulting from ova laid during the first part of July, not pupating until the end of the first fortnight in September, whilst the bulk, though they take a longer time to feed up than the very first, certainly did not take more than two-thirds of the time spent by the laggards. I should say that the partial second-brood of *P. machaon* spends from about three weeks to a month in the pupal state.

VIII. *Movements*.—The larva of *P. machaon* is exceedingly sluggish in its habits, particularly when young, and I have known it starve on a withered leaf rather than migrate to a living one touching this. I have never observed it move backwards when young, and, when older, only gradually, as it finds the leaf it is eating across disappearing in front of it. It will, however, when young, shake its head sharply from side to side (*cf. anteà*), and, when older, if an *aphis* settles on it, probably in the latter case mistaking an *aphis* for an *ichneumon*. It never retreats to a sheltered position in wet weather.

IX. *Silk-spinning habit*.—This varies with the foodplant; on *Ptelea*—a tree—the young larvæ spin noticeably more silk than they do when feeding on the lower *Skimmia* bushes. I suppose because on the fluttering leaves of the *Ptelea* they need a firmer foothold in the wind. Again, when resting or feeding upon fennel-plants, they seem to spin no silk at all, except when about to undergo ecdysis, perhaps because the slender and rounded leaves of the fennel afford them a sufficiently secure position without having to attach themselves to anything else. The larva appears to spin a certain, though variable, amount of silk when changing its skin, but not always otherwise. The adult larva only spins silk when undergoing ecdysis.

X. *Miscellaneous (cryptic effects, etc.)*.—(1) When young the larva of *P. machaon* seems to rely for protection against its enemies almost entirely on cryptic effects, when older on effects that are cryptic, but warning, when it is discovered. At first it resembles a minute speck of black, and, as is well-known, a little later on it assumes that saddle-marking of so many Papilionid larvæ which imitates a bird-dropping. Later on, it becomes a singularly conspicuous object when removed from its foodplant and placed amid other surroundings, but one which is easily passed over at a casual glance when resting or feeding amongst the bright green leaves. A good reason for supposing that the markings of *P. machaon* are cryptic as well as warning, in its latest larval stage, is that I have noticed that the larvæ feeding on fennel have a habit of ascending to the flower-heads of that plant when full-grown, where they are much more difficult to see than when amongst the plummy leaf-manes. Then the bird-dropping markings of *P. machaon* may serve a double purpose, as I have noticed that the larvæ feeding on the seed-pods of *Dictamnus* are much lighter in colour (indeed, they closely resemble the light brown-green ground colour of the pods) than those feeding on *Skimmia*, etc.

(2) The larva of *P. machaon*, in its last stadium, exhibits great variability both in the size and colour of its markings. The green ground colour, the black bands, and the red spots being different in tone and in extent in almost each individual.

(3) The larvæ of *P. machaon*, in many cases, extrude their osmateria less readily when full-grown. Some, indeed, refused to do so at all, though subjected to much rough handling, whilst others would do so readily, even when suspended for pupation. As regards the pupating-habit, there appear to be two distinct strains in our English *P. machaon*, some (about a third) remaining sluggish till the last, and pupating either almost *in situ* of their feeding-ground upon the young stems of the *Skimmia* bushes or lower down beneath the branches; whilst others will wander a considerable distance in search of a suitable spot. I have noticed that those which pupate more than a foot from the ground, unless when hidden amongst the bushes, are invariably stung by the small ichneumon which infests *P. machaon*. This year, out of about a hundred pupæ which I found under the wooden framework, etc., of my butterfly-house not one had escaped. I have many small deciduous trees growing in my butterfly-house, but I have never found a *P. machaon* pupa amongst the leaves of these, I suppose, because in winter a green pupa on a bare twig would be a conspicuous object to birds, though in summer it would be well protected by the leaves from the attacks of ichneumons. I think that perhaps this is a

good instance of how what must seem a complicated mental choice—for the larvae pupate readily enough amongst the evergreen *Skimmia* leaves—has arisen through natural selection.

By the bye, the time given for quiescent position of *P. machaon* after girth is spun (Tutt, *Nat. Hist. Brit. Lep.*, vol. viii., p. 77) is shorter by half a day at least, and by a whole day in most cases, from what I have observed taken even in warm weather.

Myrmecophilous Notes for 1908 (with plate).

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

(Concluded from, vol. xx., p. 284.)

CYNIPIDÆ.—*Rhoptromeris formicaria*, Kieff.—Professor Kieffer has given this name to an insect which I took in a nest of *Formica fusca*, in the New Forest, on June 6th, as it was new to science.

PROCTOTRUPIDÆ.—*Serphus gravidator*, L.—When digging up a nest of *Formica sanguinea* at Woking, on July 15th, to obtain the winged sexes, I found a specimen of this insect in the centre of the nest. I may mention that the male ants were much more abundant than the winged females.

Gonatopus myrmecophilus, Kieff.—Several specimens of this species, which is here recorded for the first time in Britain, were obtained in company with *Pezomachus anthracinus* (before mentioned), and *Lasius niger* on the sandhills at Deal, on June 21st.

Gonatopus distinctus, Kieff.—A specimen was swept up off bracken in the New Forest, in company with specimens of *Formica rufibarbis* var. *fusco-rufibarbis*, on June 8th. The colour of the *Gonatopus* agrees well with that of the ant. It appears to have only been found at Oxshott and Newquay in Britain, before. As I have pointed out before, the species of *Gonatopus* belong to the class of (myrmecophilous) insects, etc., which much resemble ants in appearance, hunt their prey in company with ants, or in the neighbourhood of ants' nests, and obtain protection from their resemblance to the ants, *i.e.*, my group iii., in the "Myrmecophilous spiders" (*The Zoologist*, 1908, p. 420).

Soxotropa subterranea, Kieff.—This little species in the *Diapriidae*, was also new to science, when I took it at Blackgang Chine on August 17th, last. It occurred with *Solenopsis fugax* and *Lasius flavus*, at the roots of *Arenaria maritima*.

I have again to thank Prof. Dr. T. T. Kieffer for his kindness in naming the above insects for me.

DIPTERA.—*Scatopse transversalis*, L.—I captured specimens in a nest of *Formica rufa*, in the Haye Woods, near Knowle, Warwickshire, in May. It will be remembered, that I have already bred a new variety of this species in numbers from my *L. fuliginosus* nest from Wellington College.

Limosina rufilabris, Stnh. ?—A specimen of a small fly of the genus *Limosina*, which I took in Scotland, is queried as this species, by Mr. Collin. I found it in the galleries, in a nest of *Formica fusca*, among the ants, under a large, heavy stone, at Loch Arber, near Dumfries, on April 30th, last. The ants paid no attention to it. I have bred *L. curtiventris*, Stnh., in numbers from my *L. fuliginosus* nest referred to above.

Limosina fungicola, Hal.—A specimen was taken with *F. rufa*, in

the Haye Wood, near Knowle, in May. I have also bred this species from my *Lasius fuliginosus* nest. Some species of the genus *Limosina* are therefore associated with ants. The larvæ probably feed in decaying vegetable matter and refuse in the nests.

Medeterus truncorum, Stnh.—A specimen was bred out of my *F. rufa* observation nest from Weybridge, in March.

Corynoptera, sp. ?—A species of this genus was taken in the débris of a *Formica rufa* nest, at Weybridge, in May.

Sciara, sp. ?—Several specimens of a small species of this genus were bred out of my *Tetramorium caespitum* nest from Whitsand Bay, in February and April.

Microdon mutabilis, L. (see pl. ii., figs. 1-3).—I am, unfortunately, unable to add much to the knowledge of the habits of the larva of this species. During my absence this summer, my *Formica fusca* nest was first allowed to get too dry, and then watered too much, with the result that the nest was attacked by mould, and the whole of the contents destroyed. As I have now no more material, it is perhaps as well to publish such observations as I have been able to make. On April 18th, 1907, I found a nest of *Formica fusca* under a stone at Porlock. On the underside of the stone was a fullgrown larva of *Microdon mutabilis*, another which had just pupated, and an empty pupa-case. The pupa developed the two little horns which it bears, between April 22nd and 23rd, and hatched on the morning of May 21st. The fly was walking about at 3 p.m., the wings not having developed; by 6.30 p.m. the wings were fully grown. The larva pupated on April 24th, one horn was put out on May 4th, and the other showing on May 5th, but this horn was never fully developed, and the fly never hatched, though its body could be seen inside the pupa-case.

On April 19th, 1907, I found another nest of *F. fusca*, also at Porlock, under a stone; this contained a number of *Microdon* larvæ, on the stone and in the galleries of the nest. I dug up the whole nest with two deälated queens and a lot of workers, and when I got home fixed them all up in a glass bowl half full of sand, in my study. One larva pupated on the side of the bowl on April 24th, and the fly hatched on May 27th. Whenever I lifted up the clump of earth which covered the nest in the bowl, the *Microdon* larvæ were always to be seen in the bare galleries of the nest, among the ants. This I did at various times, from May to December, 1907, and January to June, 1908. Occasionally a larva came up on to the top of the nest, and crawled about, and then returned again. In April, this year, the queens had laid a number of eggs, which the workers used to bring up in the sun. On July 15th and 18th, two *Microdon* larvæ came up and pupated against the glass side of the bowl. At different times I took larvæ out to exhibit (at the Royal Society, and the Conversazione Ent. Soc.), and to be photographed. I also isolated specimens with their hosts in plaster nests. I have written in my note-book, May 7th, 1907: "The ants (*F. fusca*) appeared to gently bite at the larvæ, but not in any way to attack them." I also introduced them to specimens of *F. rufa* and *F. sanguinea*, but these ants appeared not to notice them. I sent a larva this year to Mr. Grosvenor, of the Oxford Museum, to dissect. He writes, "there was no solid food in the fore-part of the gut, and very scanty brownish faecal matter in the

rectum. I think the beast must feed on the soft parts and juices of insects." Wasmann says,* the ants appear to nurse these larvæ as they do their coccids, but, later, he writes† that the larvæ of this species which he had found in a nest of *F. sanguinea-fusca*, at Linz-on-the-Rhine, and had under observation for months, were entirely ignored by the ants. Adlerz suggested‡ that the larvæ of a species of *Microdon* he had found in a nest of *Camponotus herculeanus* in Sweden, subsisted on the moist and tender wood, forming the walls of the ant-galleries in pine-stumps, although they were also found in burrows in the dry bark. He also records that the ants paid no attention to them.

Wheeler writes* of some larvæ of an undetermined species of *Microdon*, seen in a nest of *F. consocians*, at Colebrook, Conn., as follows — "These were found, July 7th, in a single nest, under a large stone, lying on a lot of twigs, grass-roots, etc. Three larvæ were seen at this time, one nearly mature, and one about a quarter grown. On the twigs and lower surface of the stone there were some twenty empty puparia from which the flies had already escaped. The three larvæ were placed in a "Fielde nest" containing several hundred *F. consocians* workers. The two older ones at once applied their flat creeping-soles to the glass bottom of the nest, and with their hard rough backs resisted the attacks of the workers. The small larva was not so successful. The ants turned it over on its back, and for two days kept licking and biting it, till it was killed and reduced to a small granule. The two large larvæ kept crawling slowly about the nest. They raised the anterior end of the body a little distance from the glass surface, and moved the small pointed head, which is just beneath it, from side to side, apparently in search of food. They showed signs of uneasiness when exposed to strong light. They remained in good condition till August 23rd, when one of them disappeared. It had probably been eaten by the ants. The other lived till September 10th. Some days previously it had begun to shrivel, and finally dried up without losing its hold on the glass. I have failed to ascertain the nature of the food of these larvæ. July 25th, I again visited the wild *F. consocians* nest, but found that the ants had moved away. On the twigs there were two more half-grown, but rather emaciated, *Microdon* larvæ, which had been left behind by the ants. The fact that these larvæ were so emaciated, and died soon after they were placed in the same "Fielde nest" with the others, shows that the presence of the ants is in some way essential to the well-being of these singular syneketes."

We see from the above that *Microdon* larvæ belong to the indifferently-treated lodgers, and that it is necessary for them to live with ants. The question of their food, however, is still unsolved, and I cannot agree with Adlerz that they subsist on wood, as so many species occur in the bare earthen galleries in ants' nests.

ARANEINA.—*Thyreosthenius bivovata*, Cambr.—I found this species in nests of *Formica rufa*, at Haye Woods, near Knowle, in May and Nethy Bridge, in September.

* *Kritisches Verzeichniss der myrmekophilen und termitophilen Arthropoden*, 1894, p. 173.

† *Erster Nachtrag zuder Ameisengästen von Hollandisch Limburg*, 1898, p. 7.

‡ *Myrmecologischer Notiser. Entomol. Teilschrift*, 1896, pp. 131-132.

* *Bull. American Mus. of Nat. Hist.*, 1906, p. 62.

Eransia merens, Cambr.—I found specimens in a nest of *Formica fusca*, at Nethy Bridge, in September.

Micarisoma festivus, C.K., was taken in company with *F. fusca*, in the New Forest, in May, as was also *Harpactes hombergi*, Sep.

Dilemma donisthorpei, Cambr.—This little species was described* from specimens taken by me at Kew Gardens, with the little ant *Wasmannia auropunctata*, to which it bears a strong superficial resemblance. I found it in some numbers in February and March.

Salicus formicarius, Walt.—I took a ♂ and two ♀s of this very ant-like spider, running about in company with *Myrmica scabrinodis*, at the roots of *Lotus major*, at Sandown, Isle of Wight in August. Father Wasmann records it in the neighbourhood of *F. rufa*, *F. rufibarbis*, and *Myrmica laevinodis*, in Holland.

ACARINA.—*Laelaps myrmecophilus*, Berl.—I found this species in April at Dartmouth, with *Myrmica ruginodis*.

Laelaps cuneifer, Mic.—I took this species this year with *Formica rufa*, at Knowle in May, and *F. fusca* at Bewdley in May, and with *F. sanguinea* at Woking, in July. Berlese† records it over the whole of Europe, and in America, with many different species of ants.

Uroplitella minutissima, Berl.—I found this little species in some numbers in nests of *Lasius niger* at Kingswear, in April.

Trachyuropoda coccinea var. *sinuata*, Berl.—I took this variety, which is new to Britain, in plenty, in company with the last species, in nests of *Lasius niger* at Kingswear, in April.

Sphaerolaelaps holothyroides, Leonardi.—I took a specimen of this mite, which is here recorded for the first time in Britain, in a nest of *Lasius umbratus* at Bewdley, in May. The mite is the same colour as the ant, and, when it moved, it looked like the abdomen of an ant walking about by itself. Berlese records it with *Lasius affinis*, *L. umbratus*, *L. flavus*, and *Phidole pallidula*. My friend, Dr. Joy, tells me he used to see this species at Wellington College, with *Lasius umbratus*.

COCCIDÆ.—*Ripersia subterranea*, Newst.—I took this species in some numbers in a nest of *Lasius niger* under a large stone at the mouth of the Dart, near Dartmouth, last April. It has only been taken in Britain before at Ingoldisthorpe, near King's Lynn, by Mr. Newstead, with *L. flavus*, and with the same ant near Edinburgh, by Mr. W. Evans. I have to thank my friend Mr. E. Green for the name of this species.

EXPLANATION OF PLATE II.

Fig. 1.—Imago of *Microdon mutabilis*.

Fig. 2.—Pupa of *Microdon mutabilis*.

Fig. 3.—Larva of *Microdon mutabilis*.

NOTES ON COLLECTING, Etc.

PAIRING-HABIT OF *PETASIA CASSINEA*.—On October 31st, 1908, I observed two *Petasia cassinea* sitting on a gate-post in copula, in Ashton Wold, where the species is common. As I approached they fell to the ground, where they remained on their backs feigning death. Has this habit been noticed before?—N. CHARLES ROTHSCHILD, F.E.S., 5 and 6, Chelsea Court, Chelsea Embankment. November 25th, 1908.

HYBERNATION OF *PYRAMEIS ATALANTA*.—With regard to the hyber-

* *Proc. Dorset. Nat. Hist. and A. F. Club*, vol. xxix., 1908.

† *Redia*, vol. i., p. 416.

nating of *Pyrameis atlanta*, I saw butterflies flying by the lake side in early June, and, on August 30th, found eggs and young larvæ on a cluster of nettles not more than 50 yards from my house. I set the youngsters to work to find me a few larvæ and successfully raised about a hundred. The imagines began to appear towards the end of September and continued doing so until October 20th, when the few that were left were destroyed by a mouse. To-day I noticed a butterfly hibernating on the wall of an outhouse, and this proved to be *P. atlanta*. I should, perhaps, add that winter has already set in here, i.e., it freezes at night and the ground is covered with snow.—P. H. MUSCHAMP, F.E.S., Staefa, Zürich-See. *November 26th, 1908.*

AGRIUS CONVOLVULI AT CHICHESTER.—A worn specimen of *Agrius convolvuli*, taken in a yard here, was brought to me on November 15th, 1908.—JOSEPH ANDERSON, Alre Villa, Chichester. *November 18th, 1908.*

THE "FORWARD" HABIT IN CHRYSOPHANID LARVÆ.—This season, a second brood of *C. chryseis* (*hippothoë*) from a parent ♀ from Salvan (Switzerland), taken early in July, began to show an inclination to hibernate, as usual, late in September, for the most part while quite small; two specimens, however, fed up, and produced pupæ in the middle of October. I regret to add that, though kept indoors, these pupæ appear to have perished—killed, perhaps, by the brief interlude of cold weather that preceded the present summer-like temperature (October 28th).—R. M. PRIDEAUX, F.E.S., Brasted Chart, Kent. *October 28th, 1908.*

EXTRAORDINARY DATE OF EMERGENCE OF CLOSTERA RECLUSA.—On Nov. 14th I was examining my breeding-cages for *Hybneria aurantiaria*, *H. defoliaria*, *Cheimatobia boreata*, and *C. brumata*, when, to my surprise, I found a freshly-emerged specimen of *Clostera reclusa*. My breeding-cages are, and have always been, out-of-doors, so there was nothing artificial in the conditions to account for this, and I can only attribute it to the extraordinary autumnal season, which has caused so many records of belated flowers, etc., and has resulted, in the case of my own wild ducks, in four November-hatched broods.—PERCY C. REID, Feering Bury, Kelvedon. *November 16th, 1908.*

CURRENT NOTES.

Mr. F. N. Pierce has at last been persuaded to publish his investigations on "The Genitalia of the British Noctuid Moths," and hopes to have the book ready for purchasers in a few weeks. It is well-known that Mr. Pierce and the Rev. C. R. N. Burrows have been doing a great deal of work in this direction, and the necessity of publishing the material prepared became imperative. The wonderful progress that has been made in the study of these parts in recent years, and the importance of bringing structural characters to bear on the results obtained by the wing-markings, and other more or less superficial characters, will make the book quite indispensable to scientific lepidopterists. The genitalia of some 320 species are to be figured, and the price of the book will be as low as 5s.

We understand that, in order to thoroughly illustrate vol. iii of *A Natural History of the British Butterflies*, it is necessary to obtain several more subscribers to the monthly parts. A very large number of really valuable scientific illustrations are available for each species,

but it is impossible to reproduce all of these with the present subscription list.

The last meeting of the Entomological Club was held on December 8th, 1908, at 58, Kensington Mansions, S.W., when Mr. H. St. J. K. Donisthorpe was the host. The members and visitors were received by Mr. and Mrs. Donisthorpe, and, after an adjournment for the inspection of the ants' nests on which Mr. Donisthorpe is experimenting, supper was served at 8 p.m., Dr. F. Dixey, Dr. E. Joy, Rev. F. Morice, Messrs. R. Adkin, E. C. Bedwell, H. Rowland-Brown, J. E. Collin, H. Dollman, H. Willoughby-Ellis, E. E. Green, A. H. Jones, W. J. Kaye, W. E. Sharp, R. South, J. W. Tutt, and G. H. Verrall, being among the members and friends present. A most enjoyable evening was spent, the company mostly dispersing about 11 p.m.

BITUARY.

John Adolphus Clark, M.P.S., L.D.S., F.E.S.

(BY TWO OF HIS OLDEST FRIENDS.)

On December 16th, 1908, there passed from amongst us another of those links with the older school of practical entomologists, whose number has decreased so rapidly of late.

Born at Aldermanbury, in the City of London, November 16th, 1842, Mr. Clark's family removed, when he was but eighteen months old, to Homerton, at that time famous for its rose gardens. At a very early age he developed the love of Nature, which was one of the marked characteristics of his after life, for, at six years of age, when Homerton was very different from the locality which we know by the name now, he was already a collector. This must have been one of the centres of his activities for some years, for his beautiful series of *Eucnemidophorus rhododactyla* was, he used to assure his visitors, much to their surprise, entirely from the gardens there.

Brought up as he was, before bricks and mortar had defaced the county on the east side of London, he had full opportunity to examine and record the now vanished fauna of the district. "I have collected with him all over Hackney, Stoke Newington, and Clapton, in fields and lanes, which are now covered with houses, and in Epping Forest, in the morning and late in the evening," writes one of his old friends, who in those early days was his companion and co-collector.

Later on he commenced business as a Pharmaceutical Chemist, in the Broadway, London Fields, and carried it on successfully, and with the hearty good-will of that somewhat difficult and always pugnacious neighbourhood, for nearly 40 years. Retiring in 1896 his friends rejoiced in his well-earned rest, if his still ceaseless activity in the pursuit of Natural History could be called rest.

To those who knew him—and who amongst the entomologists of London, at least, did not know him?—he was always a warm, kind friend, generous, helpful, hospitable, and had a way of making his visitors feel that their visits were never so frequent as he would have wished.

Mr. Clark may be fairly described as one of the originators of local entomological societies. He joined the Haggerston Society almost from its commencement, when its headquarters were at the "Brownlow Arms," Haggerston and followed its fortunes until the

day of his death. He was one of those who promoted its removal into London, and the change of name to "The City of London Entomological and Natural History Society." With Sir John Lubbock (now Lord Avebury) and the late W. H. Thorntwaite he was instrumental (1890-91) in arranging for the accommodation of the Society in the London Institution, Finsbury Circus.

As President, 1890-1895, and as Honorary Treasurer, 1890-1896, of the Society he always helped it generously in its financial crises. His connection covered 49 years, and so regular was his attendance at the meetings, that his absence from his accustomed chair cannot fail to impress all the members.

He was also a Fellow and a Life-Member of the Entomological Society of London, a Member of the South London Entomological Society, The Ray Society, and the Essex Field Club. During his connection with the old Haggerston Society, he took part in what he described as the first Entomological Exhibition ever held. He was an extensive exhibitor at the Great Entomological Exhibition at the Royal Aquarium, in March, 1878, and was always pleased to contribute material to all such efforts.

His collection of British lepidoptera is very extensive, covering the whole order. The numerous cabinets abound with varieties and aberrations, in which he took the keenest interest. Of *Arctia caja* it is probable that no man ever previously assembled such a number of curious forms. He had been able to secure fine series of our extinct or very rare species. Numbering amongst his correspondents F. Bond, J. T. Carrington, H. Doubleday, H. G. Knaggs, W. Machin, E. Newman, J. E. Robson, H. T. Stainton, S. Stevens, and, in fact, almost every well-known entomologist of the past, he was well equipped with knowledge on all points of entomological lore.

As a field entomologist he was excellent. Epping Forest, past and present, was of course to him an open book. Wicken, the New Forest, Folkestone, the Home Counties, North and South Devon, and Scotland, were centres of his activities, and in many of these localities it will be long ere he is forgotten.

At Stevens' Auction Rooms, his was a well-known face. He always knew what he wanted, and never hesitated to pay a reasonable price for such specimens as he required.

Like so many active collectors, Mr. Clark rather shrank from publishing his knowledge of Natural History, but when necessary, or helpful, he put his observations on record for the benefit of others. His paper on *Mimas tiliae* (*Ent. Record*, vol. i.), and that on the variation of *Peronea cristana*, published in the *Ent. Record*, vol. xiii., both beautifully illustrated, will long remain the authority upon these species. He had at the present time several new forms of *P. cristana* waiting to be named and figured. He had also in contemplation a corresponding examination of *Sarrothripus undulanus*, and had, with that intention, gathered an enormous amount of material, which we hope will not be lost to science. Other occasional papers of his appeared from time to time in the magazines, of which it may be said, as of everything he took in hand, that what he did, he did thoroughly and well. Nor were his interests confined to lepidoptera. For some time shortly before his death, he had been arranging his collection of bees. A keen sports-

man, he had studied the habits of the British birds, recognising most of them by their song, note, or flight. Some 70 or 80 cases of stuffed specimens, many shot by himself, attest not only his interest, but also his skill, for he added to his many occupations that of a skilful taxidermist. Beetles, British birds' eggs and shells, with various other Natural History objects, all came within the circle of his devoted attention. He also loved his books, and, on Natural History subjects, his modern library was fairly complete.

For several years Mr. Clark had known the critical state of his health. Some years since he had sustained a cowardly attack from would-be pick-pockets when walking in Bethnal Green, being brutally and deliberately struck repeatedly over the region of the heart. Such an assault could not have taken place in Hackney or Haggerston, where he was universally known and respected. Whether this had any connection with his fatal malady, may be a question. He succumbed to an attack of angina pectoris, after four days' illness. There can be little doubt, however, that the recent sudden deaths of his son-in-law and little grand-daughter, depressed him greatly, and predisposed him to the final, fatal attack.

Mr. Clark was laid to rest at Chingford Mount, on Saturday, December 19th. All London entomologists, at least, will feel that they have lost a friend, and will join with the writers in offering their sincere condolences to Mr. Clark's widow and daughters in their sad series of bereavements.—J.S.S. and C.R.N.B.

CHRISTMAS MDCCCCVIII.

(PRINTED BY KIND PERMISSION).

[Learned Aurelians call a lovely little Moth, that appears in February, sitting on or flitting round the leafless oak-trees, by the beautiful name, *Hybneria Leucophaearia*: and simpler folk call it by the yet more beautiful name of *The Spring Usher*. It is amongst the first of all moths to appear, as the Winter begins yielding to Spring.]

Leucophaea, Ashen-gray !
So the Learned, Pretty One,
Name you : sleeping in the sun
This short February day,
Nestled closely to your oak,
Hardly from itself discerned ;
Gentle Flutterer, all but turned
In your dun-barred quaker cloak
To semblance of the aged tree,
That its hoary mottled side
Lends you, safely to abide
Till day dies, and dusk shall be :
Sweet Spring Usher, named aright
In our homely English phrase,
You, who brave these wintry days,
Harbinger of Spring's delight :
Comes the evening, and you flit
Gently round the barren boughs,
Seeking where to hear your vows
She, your destined Mate, may sit.

Just an Insect, nothing more !
Born to-day, to-morrow dead !
Is it all that may be said,
Watching how you pause or soar ?
You and I, my Little One,
You and I alert with life :
Whence and whither ? Nature rife
With energy, as seasons run,
Brings to birth or you or me,
Each a riddle none may read :
Hath She some mysterious need
You and I awhile should be ?
Atoms both, what can we count
In her universal plan,
You a moth, or I a Man,
As aeons upon aeons mount ?
Ah ! as you, if I could bring
Hope to some, that there shall rise
Days serener, bluer skies,
Promise of approaching Spring !

SELWYN IMAGE.

With my best Christmas and New Year's wishes, 1908-1909.

20, Fitzroy Street, W.

Retrospect of a Coleopterist for 1908.

By Prof. T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S.

I have this year to note the largest increase to our list for many years, though, I may say frankly at once, I am of opinion that some of these additions will not stand the test of time. In view of the unusual length of the retrospect of last year, I propose to condense considerably my remarks on this occasion in reference to most of the additions, which I will now take in order.

Notiophilus pusillus, Wat. (= *bigeminus*, Th.), introduced by Dr. Joy, *Ent. Mo. Mag.*, xlii., p. 103. As I write this article, the January number (1909) of the above journal has appeared, and Dr. Joy, on page 12, withdraws this addition.

Notiophilus hypocrita, Spaeth., introduced by Dr. Joy (*loc. cit.*, p. 103); this species (?) is not recognised by Ganglbauer, and I agree with Mr. Champion that it "is a very dubious species, and scarcely more than a variety."

Dromius angustus, Brulle.—Mr. Champion (*loc. cit.*, p. 125) introduces this species on specimens taken in July 1906 at Woking, under bark; it is perhaps mixed with *meridionalis*, Dej., in our collections.

Laccobius purpurascens, sp. n.—Mr. Newbery described this insect (*loc. cit.*, p. 30) as new to science from specimens taken by Mr. de la Garde, in May, 1906, at Shaldon, Devon; it has also been taken by Mr. Champion and Mr. Keys in Devonshire. The describer gives no structural characters to separate it from *nigriceps*, Th., and I am of opinion that it is not entitled to specific rank, and that it is a mere colour variety.

Helephorus porculus, Bedel.—This species, which had already been recorded as British, has now been definitely brought forward by Mr. Newbery (*loc. cit.*, p. 88); it has been confused with *rugosus*, Ol. I have this summer taken it at Nethy Bridge.

Helephorus griseus, Hbst.—Mr. Edwards (*loc. cit.*, p. 218) has worked out a fresh table for the identification of this extremely difficult genus, and has given some notes as to the distribution of the species in this country; as far as I can make out, he has added the above species to our list—he states that *brevipalpis*, Bedel, and *griseus*, Hbst., are equally common. Canon Fowler (*Col. Brit.*, vol. i., p. 239) gives the latter insect as perhaps a synonym of *brevicollis*, Thoms.

Aleochara crassiuscula, Sahlb.—Taken by Mr. West at Yarmouth and at Lewisham, also by Mr. Walker at Oxford, and introduced by Mr. Champion (*loc. cit.* p. 194), who says it is closely allied to *tristis*, Gr.

Oxypoda perplexa, Muls.—Dr. Joy states (*loc. cit.*, p. 51) that he has submitted specimens of an *Oxypoda*, taken by himself in rabbit-burrows at Streatley, to Capt. Deville, who thinks they are the above species, though "he will not absolutely commit himself to them." Dr. Joy appears to have no doubt as to the correctness of the identification. In view of the fact that it was a species unknown to Ganglbauer, it is a pity Dr. Joy did not go to the original description given by Mulsant and Rey—according to these authors *evoleta*, Er., is by no means confined to the coast.

Calodera protensa, Man.—This species has been taken by Mr. FEBRUARY 15TH, 1909.

Harwood in an osier bed at Colchester, and was introduced by Mr. Champion (*loc. cit.*, p. 225), who says it is allied to *C. nigrita*, Man.

Philonthus concinnus, Grav.—Dr. Joy points out (*loc. cit.*, p. 51) that most of the specimens standing in our collections under the name of *ebeninus*, Grav., are the above species, which is a much smaller insect, and has the penultimate joint of the antennæ more transverse. I have taken true *concinnus* at Sandown, Isle of Wight.

Olophrum assimile, Pk.—This species was taken in numbers in flood-refuse on the banks of the Spey, near Nethy Bridge, by Mr. Donisthorpe and the writer, last September (*Ent. Record*, xx., p. 255).

Clambus punctulum, Beck.—Mr. Donisthorpe (*loc. cit.*, p. 293) introduces this species again to our list on specimens taken by evening sweeping at Chattenden; it is separable from *minutus*, Stm., by the form of the antennal joints, and its size.

Anisotoma floricorvis, Ch.—This species has been confused with *parrula*, Sahl. Dr. Joy (*Ent. Mo. May.*, p. 174) pointed out the difference, and stated that he had taken it at Bradfield. Mr. Champion later (*loc. cit.*, p. 206) gave a number of localities in which he had found it.

Colouzebi, Kr.—This is considered a genuine species by Ganglbauer, and Dr. Joy (*loc. cit.*, p. 38) says that it differs from *dentipes*, Sahl., of which it has been treated as a variety only, in shape, punctuation, and pubescence.

Euplectus bescidicus, Reitt.—Dr. Joy introduces (*Ent. Record*, xx., p. 56) this species on specimens taken under bark at Enfield by Mr. Pool; there are specimens in the Bates' collection taken by Lawson at Scarborough.

Corticaria linearis, Payk.; *C. eppelsheimi*, Reitt.; *C. longicollis*, Zett.—In an interesting article on the genus, in which he gives a valuable table, Dr. Joy states that all these three species must be introduced to our list. Canon Fowler (*Brit. Col.*, vol. iii., p. 292) expressed the opinion that *linearis* and *longicollis* had been taken in this country, and Dr. Joy gives localities for all three. Dr. Joy expresses the opinion that he has been unable to find any authentic British specimens of *C. obscura*, Bris., and that, therefore, that species must disappear from our list (*Ent. Mo. May.*, xliv., p. 125).

Melanophthalma trinucatella, Man.—Introduced by Dr. Joy (*Ent. Record*, xx., p. 91) on specimens taken in Norfolk; it is entirely testaceous.

Cryptophagus lorendali, Gangl.—This species, which is treated by Ganglbauer and by Lovendal as a variety of *pubescens*, Stm., has been taken in the New Forest by Mr. Champion (*Ent. Mo. May.*, xliv., p. 123), and he is of opinion that it is a perfectly distinct species, separable from *pubescens* by its three jointed-club.

Cryptophagus hirtulus, Kr.—Taken by Dr. Joy (*loc. cit.*, p. 178) in the Scilly Islands, on a cellar window, and under haystack refuse. Mr. Newbery has a specimen taken years ago in a house at Merton.

Micrambe rillosa, Heer (= *pilosula*, Heer). This species, treated by Ganglbauer as a variety, by Capt. Deville as a species, is introduced by Mr. Newbery (*loc. cit.*, p. 105); it appears to differ from *rini*, Pz., a beetle which occurs all over the country in countless profusion on gorse, etc., only in the fact that it is a trifle larger, and has some longer upright hairs mixed with the decumbent pubescence. To create

species on such grounds as this seems to reduce the whole question of specific characters to mere trifling.

Litargus coloratus, Rosen.—Taken by Mr. T. R. Hardy in Sherwood Forest, in June, 1907, in fungus on a holly log (*loc. cit.*, p. 104); it is introduced by Messrs. Joy and Tomlin.

Parus (Dryops) luridus, Er.—Mr. Edwards, who introduces this species (*loc. cit.*, p. 102), states that it can only be determined with certainty when mixed with *prolifericornis*, F., by the male genitalia.

Longitarsus nigerrimus, Gyll.—This species is introduced also by Messrs. Joy and Tomlin (*loc. cit.*, p. 104) on the authority of specimens taken by Dr. Wallace at Cleethorpes in September, 1907.

Phyllotreta diademata, Foudr.—Mr. Newbery (*loc. cit.* p. 148) introduces this species, and says that Capt. Deville has confirmed his identification; the specimens were taken by Mr. de la Garde in South Devon; it is a close ally of *atra*, F., and *punctulata*, Marsh., and belongs, therefore, to a very difficult group of the genus.

Centhorhynchus mogantiacus, Schultze.—This is the insect mentioned by Canon Fowler (*Col. Brit.*, vol. v., p. 349) as *viridipennis*, Bris.; Mr. Champion in introducing it says (*loc. cit.* p. 2) that it may prove to be only a form of *C. timidus*, Weise (= *chalybaeus*, Brit. Cat.).

Centhorhynchus parrulus, Bris.—Taken by Mr. de la Garde by sweeping *Lepidium heterophyllum*, at Braunton, Devon, last June, and introduced (*loc. cit.* p. 195) by Mr. Newbery; the suture has a band of closely packed white scales; it is like *C. floralis*, Pk., but is easily separated by the seven joints to the funiculus of the antennæ.

Araocerus fasciulatus, de Geer.—This cosmopolitan insect is recorded by Mr. F. H. Day (*loc. cit.* p. 265) as breeding in a biscuit factory at Carlisle; it is probable it will, like many similarly world-wide species, spread throughout the country; the insect introduced by Mr. Newbery some years ago as *Tropideres hilaris*, Fahr., was in reality the above insect; the error was said to have arisen from comparing it with "a bad type," whatever that may mean.

The following varieties have also been added to our list:

Notiophilus aquaticus var. *strigifrons*, Baudi. (*loc. cit.*, p. 271), taken at Braemar, by Mr. Champion, who now appears to incline to the view that it is a var. of *pusillus*, Wat., but Ganglbauer treats it as a var. of *aquaticus*: it appears to be a mountain form.

Carabus violaceus, L.—The British specimens of this species are said to be a subspecies, which Hartert calls *sollicitans* (Champion, *loc. cit.*, p. 124).

Sunius angustatus var. *lyonessius*.—Dr. Joy says (*loc. cit.*, p. 177) that the specimens he took in the Scilly Islands are a subspecies, but as, apart from some difference in the punctuation of the elytra, the difference from the type seems to be mainly colour differences, and as Canon Fowler (*Col. Brit.*, vol. ii., p. 321) says that the colour of *angustatus* and *diversus* is very variable, I would be inclined to say it is a mere variety, and I would deprecate even giving it a name, especially the name suggested, in view of the fact that Mr. Donisthorpe says he has found it in the Isle of Wight.

Meligethes viduatus, Stm. var. *aestimabilis*, Reitt.—Taken by Mr. Day at Carlisle, and introduced by Mr. Newbery (*loc. cit.*, p. 89).

Bruchus rufimanus, Boh. var. *velutinus*, Muls.—Mr. Champion finds (*loc. cit.*, p. 1) that his exponents of *afinis*, Fröh., are this variety.

Aphodius scybalaria, F. ab. *nigricans*, Muls.; found at Deal; introduced by Mr. Jennings (*loc. cit.*, p. 155).

Malthodes minimus, L. var. *marginicollis*, Schil., taken by Mr. Donisthorpe (*Ent. Record*, xx., p. 82), at Cobham, July, 1907.

The following changes in synonymy have been recorded during the year:—*Lathrobium elongatum*, L. var. *nigrum*, Joy = var. *fraudulentum*, Gangl. (Champion, *Ent. Mo. May.*, p. 1); *Ceuthorhynchidius rherrolati*, Bris. = *C. barnevillae*, Gren.; *Ceuthorhynchus chalybaeus*, Germ. = *C. tumidus*, Weise (Champion *loc. cit.* p. 1); *Epuraea oblonga*, Hbst. = *E. thoracica*, Tourn. (Joy, *loc. cit.*, p. 106); *Dasytes oculatus*, Brit. Cat., = *D. plumbens*, Mull. (Newbery, *loc. cit.*, p. 156); and, lastly, it appears, if we follow continental opinion on the matter, we must sink *Hydnobius punctatissimus*, Steph., as it is a variety only of *H. punctatus*, Stm. (Ganglbauer, "Die Käfer von Mitteleuropa," vol. iii., p. 206); Mr. Champion draws attention to this (*Ent. Mo. May.*, vol. xliv., p. 1).

We have thus an apparent addition of 28 species and 6 varieties, while two species are deleted, but at least two of the new species are of extremely doubtful value—to one I would even decline varietal rank, and there is a doubt as to the accuracy of the determination of a third, but even with these deductions it presents a remarkable increase to our list, and I know of several other additions, which will be shortly announced, some of which will be genuinely new to science.

I can only mention a few of the more interesting captures of rare species recorded during the year. Mr. de la Garde records *Hydrochus nitidicollis*, Muls., and *Hydraena pygmaea*, Wat., from Christow, Devon, and *Arena octavii*, Fauv., from Dawlish Warren; Mr. Chaster, *Deliphrum crenatum*, Gr., from Helensburgh; Commander Walker, *Cryptophagus schmidti*, Stm., from Strood; *Lathrobium pallilum*, Nor., and *Pselaphus dresdensis*, Hbst., from Oxford; Dr. Joy, *Laemophloeus monilis*, F., from Streatley; Mr. Donisthorpe, *Agrilus biguttatus*, F., from Sherwood; *Trogolinus anglicanus*, Shp., from the Isle of Wight; Mr. Bedwell, *Procas armillatus*, F., from Sherwood, and *Gnorimus variabilis*, L., from Purley Oaks; Mr. Thompson, *Corymbites castaneus*, L., from Pately Bridge; and the writer, *Cryptophagus subdepressus*, Gyll., from Nethy Bridge; Mr. Day, *Brontes planatus*, L., from Carlisle; Mr. W. E. Sharp, *Gnorimus nobilis*, L., from South Bucks.

Several interesting notes have appeared in our entomological journals. To the pages of the (*Ent. Mo. May.*) Dr. Joy has contributed (p. 38) a series of useful notes on the genus *Colon*; he has given some fresh characters for identification of the more difficult species, and hints as to the best method of capturing them; a table for the British species of *Epuraea* (p. 106), which will be found most useful by collectors who are usually much puzzled in the identification of several species of the genus; a table, and notes (p. 125) on the genus *Corticaria*, to which I have already alluded; a note on the coleoptera of the Scilly Islands (p. 175) in which he has detailed the results of the collection he made on the Islands last April, adding 126 to the previously known species, bringing the total number now recorded from the Islands up to 275—this must surely be only a small proportion of the real number of species in the Islands; and, lastly (p. 246), some additional notes on moles' nest coleoptera; in reference to this latter point, I may mention that my friend, Mr.

Evans, will shortly publish a paper on our joint researches into the fauna of moles' nests in Scotland, but I may say at once that Dr. Joy is mistaken in thinking that *Oxypoda longipes*, Muls., is not an inhabitant of moles' nests in Scotland; we have found it in many nests and in some numbers—the few taken at large in Scotland have evidently been wanderers from the nests. Mr. J. Edwards has published (*Ent. Mo. Mag.*, xliv., p. 220) a table for the British species of the genus *Helophorus*, which will, I feel sure, simplify our labours in determining more difficult species of this genus. Mr. Champion (*loc. cit.*, p. 233) draws attention to the fact that *Dermestes aurichalcicus*, Kust., and *Micrambe perrisi*, Bris., are found on the continent in nests made by Bombycid larvæ, and he suggests that search should be made in their nests in this country.

In the *Ent. Record*, Mr. Donisthorpe publishes (p. 281) a first instalment of his interesting Myrmecophilous Notes for the year, and Mr. H. W. Ellis and Mr. A. H. Martineau also contribute (p. 56) some notes on the same subject, giving an account of their field work in the neighbourhood of Birmingham. Mr. Balfour Browne in the same journal (p. 25) published a paper entitled "Notes on the British Species of the Genus *Philydrus*, Solier," giving a table for the separation of our species, and notes as to their distribution; lastly, Mr. W. E. Sharp (p. 87) discusses, in a paper on the British List, the vexed question of what constitutes the right of a beetle to a true place in our indigenous fauna.

In the *Transactions of the Entomological Society of London* only a few papers dealing with coleoptera have appeared this year. In Part iv. for 1907 (issued February 14th, 1908), appeared Mr. Donisthorpe's paper "The Life-History and Occurrence as British of *Lomechusa strumosa*, F.," in which the author gave an account of his own observations in the field and in his observation nest, and figured the larva and his dissections of the secretory glands. In Pt. ii. for 1908 (issued September 29th, 1908), is a paper by Mr. C. J. Gahan on the larvæ of *Trictenotoma childreni*, Gray, *Melittomma insulare*, Fairmaire, and *Dascillus cervinus*, L., an interesting paper in view of the divergence of opinion as to the systematic position of the *Trichenotomidae*. Mr. Gahan is of opinion, as the result of his study of the larva, that this family should be placed near the beginning of the Heteromerous series—the larva of *Dascillus* has a general resemblance to those of the Lamellicorns—it is a root-feeder. The only other paper in this part which I have to notice is by Mr. G. J. Arrow on the classification of the coleopterous family *Dynastidae*; this paper deals principally with Oriental species, which have been somewhat neglected, the new species described are in the British Museum collection; altogether 11 new genera and 25 new species are described.

The thirty-first Annual Report (1907) of the Lancashire and Cheshire Entomological Society contains two papers of great interest and value—Dr. Bailey's Vice-Presidential Address on the Coleoptera of the Isle of Man, and Mr. W. E. Sharp's list of the coleoptera of Lancashire and Cheshire. Dr. Bailey, after giving a general survey of the Island of Man as a collecting-ground for the coleopterist, and a list of some of the more noteworthy species to be met with, discusses very fully the division of the species into the various distributional groups which it is considered we possess in these islands; this is a

part of the paper of great interest to all coleopterists, and should be carefully studied. I notice one or two slips—surely for *Bidessus unistriatus*, Schr., mentioned as belonging to the Western group, is meant *Bidessus minutissimus*, Germ.; further *Rhopalomesites tardyi*, Curt., has occurred commonly near Scarborough, and is not purely Western. Mr. W. E. Sharp's list brings the Lancashire and Cheshire list up to 1586 species, or about 45 per cent. of the British list. May I express the hope that this list will be used as a model by all local societies who may in the future undertake the work of compiling a local list in any order of insects?

Commander Walker has issued a supplement to his Oxford List, bringing it up to the end of 1907, adding 183 species, and making the total now 1580, a fine record for such a small area, and testifying to the zeal of the local workers.

In the *Zoologist* (February, 1908) appeared a translation by Mr. Donisthorpe of a short paper by Father Wasmann, on the evolution of the genus *Dinarda*, of much interest to those of us who are trying to form theories as to the evolution of new species and genera.

In the *Annals of Scottish Natural History* for January, 1908, appeared two short papers by Dr. Joy and the writer on the coleopterous fauna of the lonely island of St. Kilda.

The last paper I have to notice appeared in the *Journal of the Linnean Society*, vol. xxx., no. 197, p. 157; it was entitled "Life-Histories and Larval Habits of the Tiger Beetle," and is illustrated with plates; it is the work of Mr. C. E. Shelford, and describes that gentleman's observations in the field and in the *rirarium*, of the life-histories of twelve species or races of tiger beetles occurring in the neighbourhood of Chicago; it is a paper I would strongly advise all our younger coleopterists to read carefully.

In bringing my "Retrospect" to a conclusion, I am glad to be able to express the opinion that the past year has been a fruitful one, and has given proof that we are slowly realising the importance of the study of life-histories, and the small value of mere collections.

Notes from a lepidopterist's diary for 1908.

By JOSEPH OVENDEN.

Early in January, 1908, I paid a visit to the haunts of *Hellinsia carphodactyla*, expecting to find the larvae snug in their hibernacula, but, although a few days before the ground had been covered with snow, I found the larvae sunning on the foodplants just at the entrance of their burrows, while all around were traces of recent feeding and frass; the larvae were at this time about an eighth of an inch in length. I split several of the mined plants up, but in no case did I find any traces of hibernating larvae, so concluded that they come up from the mine in the central stem to sun themselves whenever the weather is fine enough all the winter. During January and February, *Phigalia pedaria* (*pilosaria*), *Cheimatobia brumata*, *Hybernia rupicapraria* and *H. progemmaria* occasionally decorated the street lamps on the outskirts of the town, whilst, after March, *Anisopteryx aescularia* were to be seen in their company. *Aglais urticae* was first noted on March 2nd. During March and April I turned my attention to the stems of the

Viburnum for mines of *Egeria andreniformis*, but, although I got plenty of bored stems, only two imagines rewarded my labours.

On May 6th, a run to Chattenden drew a blank, the weather being cold and showery, but a night or so later, on the outside of the wood, I found a fairish number of Noctuid larvæ, mostly *Noctua xanthographa*, *Leucania pallens*, *L. impura*, *Triphaena orbona*, *T. pronuba*, *T. fimbria*, *Noctua baja*, and *N. triangulum*, which were uncommon, whilst a few each of *Naenia typica* and *Boarmia repandata* brought us home fairly satisfied with our work. A few days after, I visited the Medway marshes for larvæ of *Adaetlylus bennettii* and *Platyptilia gonodactyla*, the latter being fairly common, but the former was, as yet, scarcely showing. A visit to the woods between Maidstone and Chatham, on May 11th, brought to light another locality for *Hellinsia carphodactyla*. On May 13th *Saturnia pavonia* (*carpini*) crawled up in the breeding-cage, and a ♀ *Xylocampa lithoriza*, from which I obtained a small number of ova, was found on a fence. On May 19th, *Nola cristulalis* was out in the woods near Chatham. From imagines taken at this time Sergeant Crocker obtained ova, and, in due course, larvæ, an account of some of the latter being given in the *Entomologist's Record* for September last (vol. xx., pp. 213-214). As to the making of the cocoon of *Nola cristulalis*, Mr. Crocker pointed out to me in his garden that the larvæ peeled pieces of the thin bark off the twigs and branches near the cocoons, carried them to the cocoon, and filled them into the walls; but one thing is not at all clear, *viz.*, that, at each end of the cocoon there are two marks of greyish-white silk. What are they for? They show very distinctly, but whether spun as a foundation to work from or whether like bolt ropes to draw the cocoon tight as they dried, we could not settle to our satisfaction.

Several unsuccessful visits to Chattenden—of *Apatura iris* and *Nola albulalis* fame—brought home the fact that, as an entomologist's paradise, these woods are a thing of the past; the extensive rearing of game, which are penned out in all the clearings, give no chance for the survival of lepidoptera in any stage. Two or three specimens each of *Hesperia malrae* (*alreolus*), *Cabera exanthemaria*, *Tephrosia bistrata* (*crepuscularia*), and larvæ of *Chattendenia w-album*, *Enodia hyperanthus*, *Egeria cynipiformis*, and *Rhodophaea consociella* being the sum of our catch.

On May 25th, a visit to the woods around Chatham resulted in my first acquaintance with *Minoa murinata* alive, when I captured a nice series of nine gems, just out. *Botys fuscalis*, *Eupithecia plumbeolata*, and *Venilia maculata*, were fairly common; odd specimens of *Macaria notata*, *Hylophila prasinana*, and *Lygdia adustata* were also taken, whilst a plentiful supply of larvæ of *Lasiocampa quercus*, *Porteria auriflua*, *Diloba caeruleocephala*, *Abra as grossulariata*, and a ♀ of *Dasychira pudibunda* on a tree-trunk brought an end to a most enjoyable outing. I might just mention one item not entomological, *viz.*, that while pushing a way through the undergrowth I was startled by the flight of a largish bird, as it were, from under my feet; it did not fly right away, but kept hovering round, and, after a short flight, came near enough for me to recognise it as a "nightjar"; its movements made me suspect that its nest was near, and, glancing around, I saw almost at my feet two eggs placed in a very slight depression in the ground, and looking exactly like the stones and pebbles with

which it was surrounded ; so like were they that, had it not been for the suspicious movements of the bird, I might have unknowingly stepped on them.

On May 27th, a very hot day, I had such an experience with *Diurni* I never remember, at this time of year, before. In a cut-down corner of the woods just beyond Cuxton, within the space of 100 yards, I saw or took eight species within as many minutes—*Gonepteryx rhamni*, *Euchloë cardamines*, *Pieris rapae*, *P. napi*, *P. brassicae*, *Brenthis euphrosyne*, *Celastrina argiolus*, and *Nisoniades tages*. June 5th, at Cuxton, was very stormy and insects shy—a few each of *Botys pandalis*, *Eupithecia subumbrata*, *E. satyrata*, *E. castigata*, with one *Hemaris tityus* (*bombyliformis*), two *Lyddia adustata*, one *Spilosoma mendica* ♀, from which I got a nice lot of ova, the larvæ from which have since pupated quite successfully, comprised my captures. A run to Halling on June 10th, with Lieut. J. J. Jacobs, was only worthy of note from the fact of finding larvæ of *Odontia dentalis* and half-a-dozen imagines of *Hellinsia carphodactyla*. On the 17th, a journey to Queensdown Warren, in bad weather enabled me to get a nice series of *Crambus chrysocochellus*. On the way home, sugar in the woods produced crowds of common Noctuids, but nothing specially worthy of note. June 24th, at Halling, produced a few rather worn *Botys pandalis* and a few good *Toxocampa pastinum*, *Oxyptilus parridactyla*, and *Merrifieldia tetractyla*. From June 29th to July 8th all the spare time was spent on the marshes at the Isle of Grayne for *Leucania faricolor*, *Acidalia emutaria*, *Mamestra abjecta*, *Hadena suasa*, and larvæ of *Malacosoma castrensis*, a nice series of each being obtained, while swarms of fine *Adactylus bennetti* and rather worn *Gillmeria pallidactyla* (*bertrami*) made us wish twilight would last half the night instead of half-an-hour. July 9th was fearfully windy, but Lieut. J. J. Jacobs and I turned up a few *Acidalia rusticata* in its old haunts at Higham ; this species is getting much scarcer than formerly in this locality, whilst a few each of *Halia rauaria* and *Hemithea thymiara* enlivened our journey into Chattenden, where a few *Melanthis rubiginata* were flying, but we had hardly got into the woods before the wind dropped and down came the rain. We, however, looked in on the old *Nola albula* ground, but only to meet with further disappointment, and the falling of the drizzling rain was no compensation for the sight of the animated snow-flakes which used to gladden our eyes and excite our nerves away back in the "eighties."

July 11th was fairly fine, and an evening spent on the marshes near Strood with *Calamia phragmitidis*, *Chilo phragmitellus*, *Homoeosoma senecionis*, and *Gillmeria pallidactyla* (*bertrami*), proved an enjoyable change. The next nine days were more or less wet and unpleasant, but, on the 20th, a fine morning tempted me into making a special journey by train to Snodland for *Ebulea stachydalis*, but the results were poor, very poor, *riz.*, a wet jacket, and a few each of *Pionaea stramentalis*, *Larentia didymata*, *Eupisteria heperata*, *Coremia quadri-fasciaria*, *Acidalia emarginata*, and larvæ of *Adaina microdactyla*. On July 21st, sugar on the marshes near home attracted a few *Mamestra abjecta* and *Hydroecia paludis*; *Calamia phragmitidis* was also common, but all too much washed out to be worth taking.

The afternoon of July 22nd was spent on the chalk-hills in the teeth of a boisterous wind, which was not pleasant, although the sun

was very bright; I managed, however, to find one quiet spot behind a thicket, and, during the lulls in the wind, I obtained a few nice fresh *Ilythia carnella*, four *Odontia dentalis*, and about a dozen each of *Pyrausta aurata*, *P. purpuralis*, and *Ennychia ostrinalis*, while from the heads of the scabious I got a few larvae of *Adkinia bipunctidactyla*, which pupated and emerged in due course. On July 26th, on the marshes near Strood, I captured *Mamestra abjecta*, *Hydroecia paludis*, *Eupithecia subnotata*, and *Spilodes palealis*, a few of each in very fair condition.

On July 27th I visited Chattenden again with Lieut. Jacobs for sugaring. Plenty of fine *Calymnia affinis*, crowds of *C. trapezina*, *Noctua baja*, *Ihodophaea sociella*, and a few *Hypenodes albistrigalis* (the latter worn) occurred, while a few *Acidalia emarginata* and *Cataclysta lemnata* were taken with the net; again we finished up our journey by getting wet through.

During the next three weeks I was too busy to get out, but found plenty to do in setting out the insects I bred—*Malacosoma castrensis*, *Lophopteryx camelina*, *Pelurga comitata*, *Adkinia bipunctidactyla*, *Adactylus bennetii*, and *Odontia dentalis*, a nice series of each. On August 18th the marshes produced a few of the second-brood of *Platyptilia gonodactyla* and *Eupithecia linariata*, also a few *Scoparia cembrae*, and a few larvae, very small, of *Eupithecia oblongata*, *E. absynthiata* and *E. scabiosata*.

On August 18th, in company with Lieut. Jacobs, I paid my farewell visit of the season to Chattenden, in hopes of taking *Leucania albipuncta*; I knew the woodcutter had cut down that portion of the woods where I took the species in 1903, but, alas, when I got there, I found the clearing studded with coops for the young pheasants, and the keeper kept fussing around for fear our light should disturb the birds; however, we got our sugar on and then, to crown all, when we returned to our starting-place, we found he had lighted a large fire to keep off the foxes. We looked over a few patches of sugar, but, finding nothing worth taking, we turned homeward, muttering our anathemas, and mentally resolving to cut our acquaintance with glorious old Chattenden, except maybe for a chance visit to the elms on the outside of the woods if any friends should still wish for larvae of *Chattendenia u-album* or *Petasia cassinea*.

Late August and early September were spent in working the waste places round Strood and Frindsbury, which were overhauled for pupæ of *Gortyna ochracea* in the stems of ragwort, dock, thistles, etc., and 20 to 30 were easily found, whilst a few kicks at the *Chenopodium* would always shake off crowds of larvae of *Apamea trifolii*, *Pelurga comitata*, *Hadena oleracea*, *Mamestra brassicae*, and a few *Eupithecia subnotata* and *Plusia gamma*. In October, *Xylina rhizolitha* was found on tree-trunks at Snodland, and was not uncommon. During November and December *Hybernia defoliaria* and *Cheimatobia brumata* were very common on the lamps round the town.

A new Coleopteron—*Homalota scotica*, nov. sp.

By E. G. ELLIMAN.

Elongate, somewhat parallel, depressed, finely and rather densely pubescent; reddish-testaceous, with the mouth-parts, base of antennæ and legs paler, head and hind-body, excepting apex, pitchy, the two or three basal segments being

slightly lighter; head, thorax, and elytra rather dull, hind-body a little more shiny. Head subtriangular, strongly narrowed, from base to front of eyes, about as broad as thorax, slightly convex, very finely punctured. Antennæ somewhat strongly thickened towards apex, points 1 to 3 elongate, third joint, a little shorter than the second, 4 and 5 about as long as broad, 6 and 7 transverse, 8 to 10 strongly transverse, last joint half as long again as penultimate. Thorax very slightly transverse, narrowed a little in front, very slightly contracted towards base, from the anterior third, with faint traces of dorsal channel. Elytra transverse, very little longer than thorax, very finely punctured. Hind-body, subparallel, very finely and densely punctured; last ventral segment furnished with rather long black hairs. Length 2·7mm. to 3mm.

The most closely allied British species to this insect are those of the *H. circellaris* group (Fowler, *Brit. Coleoptera*, vol. ii.); it may be distinguished from the members of this group by the triangular shape of the head, the thorax, too, is broader and less convex, but, as compared with *H. aegra*, there is, in this last respect, not a great amount of difference, though, of course, in colour, size, and shape of head, etc., it is a very different-looking insect.

Homalota (Apimela, Mulsatkey) macella, Cr., found in France and Germany, appears to have a greater natural relationship to the species under consideration, than any of our British species, it is, however, a smaller, narrower insect, with longer elytra, and differently formed antennæ.

This distinct species makes an important addition to the genus *Homalota*, and we owe its discovery to Prof. T. Hudson Beare and Mr. H. St. John Donisthorpe, who found it sparingly in flood-refuse on the banks of the river Spey, at Nethy Bridge, N.B., in September last.

A Midsummer's Collecting at La Granja.

By (Rev.) F. E. LOWE, M.A., F.E.S.

Attracted by Mr. Sheldon's account of his successes at La Granja, and still more by certain specimens which he exhibited at a meeting of the Ent. Soc. of London on one of those rare occasions when I was able to be present, we determined to go to Spain. We were fortunate enough to persuade Mr. A. H. Jones to join us, and, but for his cheerful company, I do not know how we should have endured the depressing weather of our first week, and the discomforts, not to say hardships, which awaited us. We were a party of three—Mr. Jones, Mrs. Lowe, and myself—with only six words of Spanish between us, and of these one was the same word, the inspiring word "mariposas," butterflies. With this slender stock in trade, we ventured into this very strange land, and returned in safety, at least, as much of us as was left after nearly five weeks of semi-starvation. Mr. Jones, to our great regret, had the time of his exile shortened, and was only able to stay a fortnight. For this reason he has asked me to include his captures and observations among my own. I am greatly indebted to Mr. Sheldon who put all his information concerning the best hunting-grounds, means of access, and hotel accommodation, at my service. He even provided a most useful sketch-map of the neighbourhood, so that we need lose no time in finding the desirable spots. I fully hoped by going earlier to La Granja than he had done, and staying as late, to make a very large addition to the number of species he had reported. I did something, but was far less successful than I had expected, for I learned that this

summer at least, I was too early for some of the things which Mr. Sheldon appears to have found abundant at the same date the year before. Probably north central Spain is subject to uncertainties of climate during the spring months, as I notice that entomologists in recording their experiences frequently say "it was a very late season." It may be that we invariably start too early, and need to readjust our ideas of the climate.

We arrived at La Granja about 6 a.m. on June 15th. "Mine host" was not yet visible, and we had some difficulty with two voluble females about rooms, but when he appeared in about an hour's time, things were easily settled. After breakfast Jones and I started on a tour of exploration. The morning was rather cool, and sunshine uncertain. We had not gone far before our attention was arrested by the evidence of a remarkable set back which vegetation had experienced. Everywhere the shrubs, and especially the bushes of oak, a curious, soft, woolly-leaved kind, were in a parlous plight. The young leaves, about half-grown, were hanging down along the sides of the branches, dying, or dead. At first we thought they were suffering from some kind of blight, but a little investigation soon showed that it was the result of cold and violent weather. Most probably there had lately been a heavy snow-storm accompanied by some frost. Almost all the young growth was destroyed, and the renewing of the foliage took place, more particularly of the oaks, during my stay. This rough touch of winter, after spring had reached the threshold of summer, could not but have a deleterious effect upon the "bugs." To this I ascribe the lateness, and oftentimes the scarceness of many species, which we had to deplore during the whole of our visit. In this our first walk, June 15th, there was very little of insect life to attract attention. It rained in the afternoon, and the bad weather, rain, and cold, continued for the next five days, during which my companion pathetically observed that "he had never seen his own shadow." On the 19th, indeed, it was so cold that we lunched and dined in great coats, and wearing caps. On Sunday, June 21st, the sun came out as a giant, and we had nothing but fine weather until the end of our visit, July 16th. Unfortunately, Jones had to leave on the 26th, so only enjoyed six days' collecting out of his fortnight's sojourn. I will not attempt to give the results of our collecting day by day, during my own prolonged stay, but will offer a few general observations, supplying in conclusion a complete list of captures with occasional notes.

Iphiclus podalirius var. *feisthamelii* was fairly common, but often very worn. Jones devoted the greater part of one morning to this insect at damp patches on the road. One female secured is remarkably large and beautiful. *Papilio machaon* was in no way remarkable, except that it appeared to be very scarce and rather small. Of the Pierids, *Aporia crataegi* was in very poor condition on our arrival, but new emergences appeared later, and I took one very fine ab. ♀ *flava*. All the *Pieris napi* which came under my notice were var. *nupaeae*, but I am not prepared to say that the type was not present. *Pontia daplidice*, scarce and worn at first, was in fair numbers and excellent condition in the middle of July. One or two *Anthocaris belia* var. *ausonia* during the first week. Both Jones and I saw one and the same *Euchloe cardamines* ♀, and no more. The entire absence of *Leptidia sinapis* was a matter of surprise. Of the genus *Colias*,

C. edusa was very abundant and much worn as a rule, in June, with a fair sprinkling of var. *helice*. A new brood began to emerge as I was leaving, but up to date, July 16th, var. *helice* had not again appeared. Many of the *C. edusa* of both sexes were remarkably small, and seemed to constitute a separate race, flying with those of ordinary size, perhaps var. *pyrenaica*. None were large and especially fine, as some I have from Gibraltar. *C. hyale* was only seen or taken three or four times. It was evidently rare, at least in the early brood. But of these few specimens, one female is a very beautiful variety. On the underside, the tips of the primaries, and the whole of the secondaries, instead of the usual dark mustard-yellow, are a greyish-white, just sufficiently pronounced to preserve the contrast with the pure white of the discal portion of the upperwings. The general effect is of almost a silver underside. If this aberration is not already recognised, it deserves a name of its own, and I would suggest *argyphaea*. Melitaeids were by no means abundant, except, perhaps *Melitaea phoebe* var. *occitanica*, which was mostly worn in the middle of June, but a month later issued again in fresh beauty. This species was, on an average, always smaller than the specimens from the Alps. I have taken hundreds of *M. phoebe* in the Rhone Valley, both sides of the Simplon, Monte Bré, Pontresina, Orta, Reazzino, etc., but have never seen from central Europe a specimen which could be said to be more than "trans ad var. *occitanicam*," as represented by the Spanish examples. A point which seems to be altogether ignored by Staudinger's absolutely insufficient description "magis variegata," is the entirely different *tone* of colour in these Spanish *M. phoebe*. It is not merely a matter of a little more or less variegated effect of light and dark colour, but the artist so to speak, has mixed his colours with entirely different pigments. In Switzerland he takes for his ground colour the ruddy tone of *Argynnis adippe*, and variegates it with black, white, and yellowish-brown. In Spain the ground colour is more that of *Dryas paphia* ♀, bedecked with lemon-yellow, and much finer tracery of black. In the Swiss forms the antemarginal band, on the upperside of the hindwings, is always strongly chevroned in black, often suffused, and sometimes containing black spots, as in ab. *cincooides*, Muschamp; the Spanish specimens have this band only delicately suggested, and often almost obsolete. Here, I may mention a beautiful male from La Granja, in which the *underside* of the hindwings has the central pale band of pure colour without any zigzag, black edging, or black spots, and no central row of black marks on the primaries underside. I took a few *Melitaea aurinia* var. *iberica* mostly worn. Jones records also *M. desfontanei* var. *baetica* male and female. *M. didyma* we found at first, not common and difficult to get in good condition; they were mostly females of the var. *occidentalis*. *M. deione* was also passing (1st brood ?) and not abundant, but many females were fine, and differed much in size. Both males and females presented endless variation in the breadth of black markings, and in intensity of colour. *M. parthenie*, thinly scattered everywhere towards the end of June, was very bright in colour, but no females. A nice series which I thought were beautifully variegated females, Mr. Wheeler thinks to be *deione*, though all have a close family likeness to *M. parthenie*. Mr. Jones reports *athalia*, I do not think that I saw or took this species—but had some of the Castilian forms of

M. deione been the original types of var. *berisalensis*,* I could better have understood why Staudinger considered the latter a variety of *M. athalia*. One very handsome melanic ♀, I supposed at first to be an ab. of *M. athalia*, but I now lean to the opinion that it is *M. deione*. The whole of the primaries are black, especially on the right side (for it is not quite symmetrical) having only a row of yellow spots of what Mr. Wheeler calls the *outer subterminal*, and a double *stigma*. The lower wings are suffused in the same way with a very large and light *discal spot*, and a row of spots of the same colour *behind the inner line*. Of the Argynnids, the first thing forced upon one's notice was the wonderful abundance and beauty of *Argynnis aglaja*. It was like *Issoria lathonia*, everywhere, and appeared to renew itself as did *Dryas pandora* all through our stay. These two could be obtained in tip-top condition from June 21st to the day we left, July 16th. *Argynnis niobe*, always var. *eris*, was decidedly scarce. The few taken appear to be smaller and less heavily marked than those of Switzerland. *Brenthis daphne* very local, and not a fine form. *Argynnis adippe* var. *chlorodippe* did not show up till July 10th, when I took one. After this it occurred only sparingly; I also took three fine var. *cleodippe*; it was not until July 14th that *Dryas paphia* was seen. I saw and took in all only three males var. *immaculata*, one in rags. I saw no type or females.

(To be concluded.)

Notes on the early stages and habits of *Pieris manni*, Mayer.

By H. POWELL, F.E.S.

Whilst with Mr. René Oberthür at Vernet-les-Bains (Pyrénées-Orientales) last August, he took me to a spot where *Pieris manni* was flying in considerable abundance, and pointed out to me the imaginal characteristics which separate it from *Pieris rapae*. Without going into details of these distinctions, this having been done thoroughly by others, I may say that there seems to be but little difficulty in recognising the two species, in the summer broods at any rate. The shape of the forewings, particularly in the males, the shape of the black spots, and the pure white of the upperside of the female *P. manni* make identification fairly easy.

P. manni is a much more local insect than *P. rapae*, frequenting woody places, and valleys amongst the hills where there is plenty of vegetation. It thrives well in damp valleys overgrown with moist vegetation. At Vernet-les-Bains its principal habitat is in the Gorge du Cady above Casteil, in spots where the favourite food-plant *Iberis sempervirens* grows. On one steep slope on the right hand side going up, in a narrow part of the gorge, it fairly swarms at times, and one but rarely finds a *P. rapae* flying with it in this locality. Close to Vernet it also occurs, but far more sparingly. Here, its food-plant is *Lepidium graminifolium*, L. It does not appear to spread to market gardens or cultivated ground. But it is not only at Vernet that this species occurs in France. Mr. Oberthür has identified specimens I have sent him from the Alpes-Maritimes, and he has it also from Digne, and

* Some time after writing the above, and the very day I received the proof of these notes for correction I stumbled across Mr. Tutti's remarks, *Ent. Rec.*, xix., p. 155, which prove the *athalia* likeness in the Spanish *deione*.

central France. I took it about the middle of August at Hyères this year in woody places near the golf links, at a time when *P. rapae* was very common in all the open fields and along the roads, but one never came across *P. manni* far from the shelter of trees. Recently I have found its larva on *Iberis linifolia* near the well-known Costebelle quarries (November 8th). The plants were growing in the shelter of trees. The species is noted also from the Marseilles district as *Pieris rapae*, var. *manni* (2 exemplaires pris aux abords du Palais Longchamp en Mai 1905, Dr. Siepi). It probably occurs in most parts of Southern and Central France, but it is no doubt often confused with *P. rapae*.

Its flight is rather weaker and slower than that of *P. rapae*, but in spite of that, it is not *always* an easy insect to take, for instance in such spots as the steep Vernet locality above mentioned. It is very fond of the flowers of the scabious, *Origanum*, and others. Like *P. rapae*, this species has several broods during the year, evolution being rapid in summer time (rather less than a month from egg to perfect insect), but much slower in autumn, when ova, laid at the beginning of August at Vernet, did not produce pupae until mid-October and later: these pupae are of the grey form and will probably not hatch until late winter. The broods overlap in summer, so one can, at any time, find perfect insects on the wing, though there are times when fresh specimens are scarce. A brood was in full swing the first week in August, and another one at the end of that month and beginning of September, but the insect became scarcer and scarcer as the month advanced, particularly after the cold weather experienced during the second week.

I watched several females in the act of egglaying on August 4th in the Gorge du Cady. The day was a fine, hot one, and the time between 11 a.m. and noon. The female selects, with great care, the plant on which she lays her egg, generally examining a number before she finds a satisfactory one. The egg is deposited on the underside of the leaf, and almost invariably in a very sheltered position, on a branch under a rock or in the shade of a bush into which she has to work her way. Plants growing in deep crevices of rock or partly under big stones where the sun does not reach them, are very often selected. I have known of one female who laid her egg without giving much time to the selection of the plant and its position. This was during a short spell of sunshine on a cloudy day, and she was evidently in a hurry to get the operation over before clouds again covered the sun. The plant was in an exposed situation and the egg was on the upperside of a leaf, but the leaf was partly turned over. Whilst egglaying, the female hangs on the leaf and, curving her body, quickly fixes the egg to the underside. Eggs are sometimes, but rarely, laid on the stem near the growing point. They are always laid singly, the female flying off in search of another plant after each operation, but she will sometimes return to the same plant again. The female will lay well in captivity if the cage in which she is imprisoned with the fresh plant be a fairly spacious one and exposed to sunlight and fresh air. It is well to put in a few flowers, such as thistles and scabious, on which she will feed before commencing to lay and during the intervals. The plant should be sprinkled with water, as she will need drink from time to time when the sun is shining on the cage. She rests occasionally

with wings open to the sun, and, should a male approach, she flattens down her wings and raises her body to prevent pairing.

Egg.—Cylindro-conical like a shell (*obus*) in shape, resting on a flat base, and sometimes slightly lopsided. Height 1·45 mm., greatest diameter 0·5 mm. *Colour and Surface.*—When first laid, the egg is almost white, with only a slight greenish-creamy tinge. On the day following it is of a decided creamy colour, which continues to deepen to a pale yellow on the third day, becoming light yellowish-orange before the emergence of the larva which takes place on the fifth day in the height of summer. Cold weather retards the process as might be expected. Surface shining, pearl-like. *Sculpturing:* There are as a rule twelve vertical or main ribs, but sometimes only eleven. These rise a little above the actual summit of the egg, forming around it a close palisade easily distinguished from the mass of the egg when it is held up to light. In some eggs a few of the ribs do not exceed the summit, thus causing very slight breaks in the palisade. These main ribs, of a rather lighter yellow than the rest of the egg-surface, are high and wide. The ridges are rounded off, not sharp. On them can be seen with the aid of a lens, numerous and minute transverse ribs, or rather one notices the little incisions, separating these ribs. These secondary ribs, though low, are wide in proportion to the width of the incisions. [These observations were made with a hand lens; no microscope being available.]

THE HATCHING AND HABITS OF YOUNG LARVA.—Eggs laid on September 1st and 2nd hatched on the 9th of that month (=7-8 days, whereas at the beginning of August the egg-stage lasted but five days). I have not seen a larva in the act of emerging, but I believe it eats its way through the side of the egg, for there is a tear in the egg-shell, showing the trace of mandibles. The shell remains upright, but is considerably shrivelled. The young larva does not eat it, apparently. It soon attacks the parenchyma on the underside of the leaf, eating little holes in it. Although its growth is rapid it is not by any means a continuous eater, nor does it eat much at a time. It feeds by day, and also I believe at night, but I have no absolute proof of this. It is not at all easy to see, and it further protects itself by resting on the undersides of the leaves. It spins a thread of silk wherever it goes, and makes a little carpet for its resting-place, and on this it fixes itself for the moult. Unless it is moulting, it can easily be made to drop from the plant with a sharp tap on the stem (less easily when young). Between September 15th and 17th nearly all the larvæ which hatched on the 9th passed the first moult. By the 21st many had already attained the third stage, whilst others had nearly reached the end of the second stage. The rate of growth depends to a great extent on the temperature. During the first stage the weather was cold, particularly at night, and progress was therefore less rapid than between the first and second moults, when the weather was warm and damp. The young larvæ certainly appear to avoid sunlight. On September 26th several larvæ were lying up for the third moult, and a few were in the fifth stage by October 1st, others passing the fourth moult on the 2nd, 3rd, and 4th. The pupæ were formed between October 14th and October 20th. The weather was generally damp, overcast, and often foggy towards the end of September and in October. There was a cold spell on the 9th and 10th, but it was of short

duration. The larva of *manni* has habits similar to those of *P. rapae*. It very rarely leaves the foodplant until full-fed, even when captive, unless the plant happens to get dry. When young, as before stated, it hides beneath the leaves, but later on, and particularly in the last stage, it is often exposed on the stems. It is very hard to find on the *Iberis sempervirens*, but not difficult to see on *Iberis linifolia* at Hyères. On November 9th, 1908, I found two larvæ near the quarries at the back of the Villa les Rossignols, Costebelle; one in the third stage, with the greater part of the head black, and the other in the fourth stage. On November 15th Mr. Raine found eight larvæ on one plant, nearly all fullfed. This was in a clay quarry near the Col de Serre. The plant was eaten down almost to a stump, no leaves, flowers, or fruit remaining. We found larvæ on other plants of the same species in the same quarry, but many vigorous and flourishing specimens had no larvæ on them. In another quarry, near La Maunière, I took one full-fed *P. manni*, one *P. rapae*, and several *P. brassicae* on some small plants of *Diplotaxis erucoides*, growing near together. In these quarries the plants were not sheltered from the sun. In autumn the female apparently does not choose plants in particularly sheltered positions. When getting ready for pupation the full-fed larva leaves the food-plant and wanders away to a considerable distance before it finally spins up on the sheltered side of some rock or stone, or in a crevice of the rock. It attaches itself in the fashion of *P. rapae*. The larva of this species has pronounced cannibal instincts. I have found it consequently rather difficult to rear a number together. The young larvæ often devour the eggs, and themselves fall a prey to their larger brothers, especially at moulting time, when they cannot escape.

(To be continued.)

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.E.S., F.Z.S., etc.

(Continued from p. 13.)

Genus II: *GRYLLUS*, Linn. (= *Acheta*, Fabr.).

This genus includes the typical crickets; the species are very numerous in most parts of the world, but only a few occur in Europe.

The body is cylindrical and hairy, and the head very obtuse, and often very large. The elytra are very flat above, generally perfectly developed. The wings are generally caudate, but sometimes abbreviated.

The species are medium-sized, or fairly large insects, usually rather stout in build.

The first two species are separated by de Saussure into a distinct genus *Liogryllus*, which is adopted by Bolivar, but rejected by Brunner.

TABLE OF SPECIES.

1. Hind tibiæ with three to six spines on each above (excluding apical spurs).
2. Head all black, with no white lines; ocelli arranged in a gently arched line.
3. Head much broader than pronotum 1. *CAMPESTRIS*, L.
- 3.3. Head not broader than pronotum.
4. Large; elytra generally long, with a yellow basal spot; wings generally caudate 2. *BIMACULATUS*, De Geer.
- 4.4. Smaller; elytra generally short, paler at the base; wings generally hidden 3. *DESERTUS*, Pall.

2.2. Head marked with lines or spots; ocelli arranged in a triangle

3. Large; wings generally long.

4. Head black, with pale thin lines; body chestnut

4.4. Head yellowish; with three horizontal bands; body yellowish

3.3. Smaller; wings generally short; colour chestnut

1.1. Hind tibiae with four to five spines on each side above; head black, frons testaceous, with an arched, pale, transverse line

4. *HISPANICUS*, Ramb.

5. *DOMESTICUS*, L.

6. *BURDIGALENSIS*, Latr.

7. *FRONTALIS*, Sauss.

1. *GRYLLUS CAMPESTRIS*, Linn.

Easy to recognise by stout build, shining black colour, yellow basal spot on elytra, and, above all, by the disproportionately broad head. Length of body, 20mm.-26mm. ♂ and ♀; of pronotum, 4mm.-4.5mm. ♂ and ♀; of elytra, 14mm.-18mm. ♂, 13mm.-16mm. ♀; of ovipositor, 12mm.-14mm. ♀.

Generally common in hot and dry places throughout Europe, except the north. In England it is very rare and local, being only recorded from a few isolated localities. It is abundant in France, though rarer in the extreme north; in Switzerland it is common up to an altitude of about 6500ft. In Belgium it occurs locally at Condroz, Arlon, Campine, and Hesbaye. It is abundant in the southern countries. In the early summer the shrill chirp of the male resounds in afternoons on sunny hillsides, but the insect is very nimble, and difficult to catch. It is mature in the spring and early summer; nymphs occur in the autumn. The life-history of this popular favourite has been described by numerous authors; the Field Cricket is the subject of Gilbert White's most charming letters. The occasional form, with fully developed wings, has been described by Krauss under the name var. *caudata*. The larvæ all black, with a metallic bronze sheen.

2. *GRYLLUS BIMACULATUS*, de Geer (= *capensis*, Fabr.).

Resembles the field cricket, but the basal spot in the elytra is paler, the wings longer, the pronotum is more depressed, and by the head which is no broader than the pronotum. Length of body, 23mm.-25mm. ♂, 20mm.-28mm. ♀; of pronotum, 4mm.-4.5mm. ♂, 4mm.-5.5mm. ♀; of elytra, 16mm.-18mm. ♂, 14mm.-20mm. ♀; of ovipositor, 12mm.-16mm. ♀.

This species resembles the preceding, but is generally easy to distinguish; there is a variety with reddish elytra, and another with short wings. It is distributed throughout Africa and Asia, and varies remarkably in size. In Europe it is confined to the south, where it is found in wild places, chiefly near water. In France it is recorded from Cannes, and also from Corsica, and in Italy, at Campo Rosso near Vintimiglia in the north, and commoner in the south. In Spain, it does not extend to the centre; in Portugal it is known from Troia, Cadaval, and Algarve. The larvæ have some pale spots and no metallic sheen.

3. *GRYLLUS DESERTUS*, Pallas (= *melas*, Charp. = *tristis*, Serville).

Smaller; black; head entirely black, with no pale markings, and elytra and wings generally short, sometimes long. Length of body,

13mm.-17mm. ♂ and ♀; of pronotum, 3mm.-3·2mm. ♂ and ♀; of elytra, 5mm.-12mm. ♂ and ♀; of ovipositor, 10mm.-13mm. ♀.

Recognisable by its smaller size, and all black head; the form with abbreviated organs of flight is the commoner; the name *tristis*, Serv., is applied to the fully-winged form.

It occurs in May and June throughout southern Europe. In France, chiefly in the south, but occasionally as far north as Fontainebleau; also at Montpellier, very common at Toulouse, Hyères, Cannes, Draguignan, Tulle, Aix-en-Provence, Caraman, and Montauban. Rather rare in north Italy: also in the Spanish Peninsula; the form *tristis* is rather rare, but sometimes occurs with the type.

4. *GRYLLUS HISPANICUS*, Rambur.

Larger; reddish-black; head depressed, black, occiput with four pale longitudinal lines; frons with yellow lines between the eyes; ocelli arranged in a triangle; elytra chestnut, long; wings caudate, rarely abbreviated. Length of body, 15mm. ♂, 17mm. ♀; of pronotum, 2·2mm. ♂, 2·8mm. ♀; of elytra, 11mm. ♂, 13mm. ♀; of ovipositor, 8mm. ♀.

Recorded from Malaga, Granada, and Alicante, in southern Spain; also occurs in Madeira.

5. *GRYLLUS DOMESTICUS*, Linn.

Size medium, or rather large; straw-coloured, with fuscous markings; elytra always, wings almost always, long. Length of body, 16mm.-20mm. ♂ and ♀; of pronotum, 2·8mm.-3mm. ♂, 3mm.-4mm. ♀; of elytra, 10mm.-12mm. ♂, 9mm.-13mm. ♀; of ovipositor, 11mm.-15mm. ♀.

If not familiar to everybody, the House Cricket may easily become so, as it is abundant in many houses and bakeries throughout Europe; it even occurs in the steam-heated neighbourhood of underground pumps in collieries in Belgium. Its original habitat is unknown, but it probably comes from North Africa. It lives in the warmest corners of kitchens and bake-houses, and lives on refuse and rubbish, especially sweet-stuff. Owing to the artificial conditions under which it lives, it is independent of seasons, and specimens in all stages of growth may be found together.

6. *GRYLLUS BURDIGALENSIS*, Latr. (= *arrensis*, Rambur = *cerisyi*, Serville).

Smaller; greyish-yellow: head black: the frons is banded with chestnut or black, with very pale, thin line; the elytra are usually long, but the wings usually short. Length of body, 11mm.-14mm. ♂ and ♀; of pronotum, 2mm.-2·8mm. ♂ and ♀; of elytra, 7mm.-9mm. ♂ and ♀; of ovipositor, 6mm.-8·5mm. ♀.

This is a kind of diminutive form of *G. domesticus*; it varies in size and colour to an extraordinary extent, and consequently the synonymy is very confused. *G. cerisyi*, Serv., is the long-winged form which sometimes occurs with the type. *G. arrensis*, Ramb. is a small dark form. It occurs in May in dry places in the Mediterranean provinces. In France it is common in the south. The form *cerisyi* is recorded from Montauban. Also in June, and the early part of July, in North Italy. Also throughout Spain, but it appears to be rarer in

the north. *G. gossipyi*, Costa, may be another form of the same species; it is rather larger than the type, and has a chestnut head with two transverse pale stripes; recorded from South Italy by Costa, and from Garruchia near Almeria in Spain, and also Cartagena by Bolivar.

7. *GRYLLUS FRONTALIS*, Fieber.

Small; dull black; head black, with a transverse arched white stripe across the frons between the eyes. Length of body, 12mm. ♂, and 13mm. ♀; of pronotum, 2mm. ♂, 2.8mm. ♀; of elytra, 4mm.-7mm. ♂ and ♀; of ovipositor, 6.2mm.-6.8mm. ♀.

Easy to recognise by its small size, dull black colour, and arched white stripe across the face between the eyes. It occurs from April to June in dry stony places and low shrubs in Central Europe; in Germany, at Glogau, Regensburg, and Tübingen; in Bohemia, and Austria, the Wienerwald, Seinmering, Kaltenlentgeben, but apparently not in France, nor Switzerland, nor south of the Alps. It is incorrectly recorded from Spain.

COLEOPTERA.

COLEOPTERA IN SUSSEX: SPECIES OF INTEREST DURING 1908.—A few noteworthy forms have occurred in the Ditchling district this last year; some of these are perhaps of sufficient interest to be recorded, *viz.* :—*Anchomenus lirenus*, Gyll.—Some sixteen examples of this scarce *Anchomenus* were taken from moss in a small wood. *Quedius longicornis*, var.—One specimen taken at roots of grass by Stannier Park. *Chrysomela orichalcia* ab. *hobsoni*, Steph.—In company with the type form on, and at the roots of, the common hemlock. The aberration was more frequent than the type form. *Chrysomela rarians*, Schal.—A very nice and variable series taken at roots of *Hypericum perforatum* on Pyecombe golf links. *Gyrometron rostellum*, Hbst.—One example by sweeping flowers (probably *Matricaria*) on Ditchling Beacon.—*Sitones ononidis*, Shp.—Extremely local, but common in Nye Wood, Ditchling. During July specimens were scarce and very rubbed; on September 2nd, some 30 were captured in half-an-hour, all fresh, and readily separable from any *S. suturalis*, Steph., I have seen. It was only taken off the *Ononis*. *Sitones meliloti*, Walt.—Occasional specimens on *Melilotus*. Usually in company with the *Tychius* and *Apion*. *Ithononcus graminens*, F.—A few examples swept from *Polygonum* sp. ? at Lewes. *Erirrhinus scirpi*, F.—Rare at the roots of *Scirpus* near Clayton. *Ceuthorhynchidius rufulus*, Duf.—Some dozen specimens found by searching *Thymus serpyllum*. Apparently the thyme was the beetle's pabulum, as the only other possible plant was *Lotus*, which seems still less probable as a foodplant for a *Ceuthorhynchidius*. *Abdera bifasciata*, Marsh.—One in the garden at Ditchling.—HEReward C. DOLLMAN, F.E.S., Hove House, Bedford Park.

INTERESTING MIDDLESEX COLEOPTERA.—*Tachinus bipustulatus*, F.—This very local *Tachinus* was not uncommon at *Cossus*-infected poplars in Edge Hill Rd., Ealing. *Lathrobium filiforme*, Grav.—By sifting dead leaves and humus soil in the vicinity of Ruisly's reservoir, several *L. filiforme* were turned up. If time had allowed, doubtless

many more could have been captured. *Bembidium clarki*, Daws., is a common beetle on the banks of this reservoir.—H. C. DOLLMAN.

GYMNETRON VILLOSULUS, Gyll.—This very local Rhyncophoran was found in the greatest profusion on aquatic plants at St. John's Pond, Cambridge, during June. It was found on *Veronica anagallis*, but also on many other water-plants. *Panayaeus crux-major*, L., was not uncommon at the margins of the pond, while *Stenolophus respertinus*, Panz., and *Bembidium flammulatum*, Clairv., simply swarmed.—H. C. DOLLMAN.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

THE LARVAL HABITS OF *PERONEA CRISTANA*, FAB.—In the introduction to his valuable notes on "*Peronea cristana*, Fab., and its aberrations," published, in 1901, in *Ent. Rec.*, xiii., the late Mr. J. A. Clark wrote as follows (p. 227): "Little, indeed, seems to be known of its life-history. Like myself, many have bred odd examples of the species, the larvæ having been obtained by general beating, and without actual knowledge of the species, until after pupation had taken place and the imagines had emerged." He then stated his belief that the larvæ feed on the lichen growing on whitethorn, although quite aware that they have been recorded by Merrin, Meyrick, and Sorhagen, as feeding on the leaves of various trees and shrubs. The purpose of this note is to draw attention to a most interesting record, of which Mr. Clark was evidently unaware, with reference to the larval habits. In *Trans. Chich. and W. Sussex Nat. Hist. and Micr. Soc.*, 1885-6, p. 70 (1886), Mr. W. H. B. Fletcher stated that he had bred *P. cristana* "from larvæ on flowers and fruits of *Pyrus aria*" collected in Arundel Park, and in his "Catalogue of Sussex Lepidoptera," published in 1905, in the Victoria History of Sussex, he gives the species as occurring in "Arundel Park, where the larvæ feed on the flowers and young fruits of *Pyrus aria*, and doubtless also on those of the hawthorn there and in many other places on the downs." I learn from my friend that, although the number of imagines reared was limited, his experience was quite sufficient to prove that, in Arundel Park, it is a regular habit of these larvæ, as well as those of *Pyrodes rheediella*, Clerck, to feed in the manner described. From the insect's haunts in the New Forest, *Pyrus aria* is absent, and since the moth occurs there among old hawthorn-trees, and is often plentiful, one can have little doubt that the larvæ normally feed, as suggested by Mr. Fletcher, with regard to various Sussex localities, on the young flowers and fruits thereof. Cannot some lepidopterist living in a district frequented by *P. cristana*, settle this point by breeding the moth from hawthorn flowers and young fruits, and also give us details about the larva and pupa, which appear to be undescribed? It is certain that the larva sometimes lives in, and feeds upon, united or rolled-up leaves of hawthorn, for the evidence of Messrs. W. Machin and W. Weston, as quoted by Barrett in *Lep. Brit. Isles*, x., p. 46 (1905), is conclusive on this matter, but, after reviewing all the ascertained facts, it seems reasonable to suppose that, when plenty of flowers and young fruits of the chosen food-plant are available, the larvæ will be found among these, but, in the years when they are insufficient in quantity, a search among the leaves will be found more or less profitable.—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. January 3rd, 1909.

VARIATION.

PARALLEL VARIATION IN LARVÆ AND IMAGINES OF LASIOCAMPUS QUERCUS.

—With reference to the aberration of *Lasiocampa quercus*, which I exhibited at the Lancashire and Cheshire Entomological Society on October 19th, 1908, and on which you make an Editorial note, and ask for a scientific statement (*antea*, vol. xx., p. 272), all I can do at present is to state the facts so far as they have gone, and I should be glad to hear the opinion of someone of authority on the subject. The larvæ from which my aberrations were bred, were taken on the Wallasey sandhills, on March 28th, 1907. Five of the larvæ taken on that day were very dark, almost black; a number of the light forms were also taken on that day. The dark larvæ were kept separate from the light, and they pupated in June, 1907. I noticed that the cocoons of the dark larvæ were very much darker than the cocoons of the lighter variety. A male emerged on July 5th, 1908, and, seeing that it was perfectly dark olive, I let it remain, hoping that a female might emerge, an event which happened on the 9th, at 9.30 a.m.; this was also dark olive; at noon the same day they paired, and, on July 11th, she laid 117 eggs. Of these, on August 10th, 12 hatched; on the 11th, 22; on the 12th, 51; on the 13th, 12. The larvæ have moulted three times, and are now hibernating. They are all very dark. Two of the dark larvæ taken on the sandhills, were stung, and the third died. I should add that all the light larvæ found at the same time produced imagines of normal colour. It will be interesting now to watch what these will produce.—W. BELL, M.R.C.S., J.P., Rutland House, New Brighton, Cheshire. November 21st, 1908. [These remarks are most interesting. It is to be hoped that the dark larvæ resulting from the dark imagines, will pass successfully through the winter, and produce imagines. We shall be most interested to hear from Dr. Bell the result of this experiment.—ED.]

TAPINOSTOLA ELYMI, AB. (? *SATURATIOR*, STGR.), IN BRITAIN.—In answer to Mr. Tutt's inquiry (*Ent. Rec.*, xx., 267) whether the dark form of this species, that Staudinger named *saturatior*, occurs in this country, I may mention that a single male in my collection agrees with Staudinger's later diagnosis in Stgr. and Rbl., *Cat.*, i., p. 189, no. 1915 (1901), and seems, therefore, clearly referable to ab. *saturatior*, although I am unable, at present, to compare it with his original description in *Stett. Ent. Zeit.*, 1889, p. 47. His subsequent definition (*loc. cit.*), is as follows:—"With the forewings darker, or darkly streaked," and, in the individual under notice, although the ground colour is hardly darker than normal, the costal half of the forewings is mainly occupied by two broad, smoky-brown, longitudinal stripes, united towards the base, but gradually diverging from before the middle, leaving a broad streak of the pale ground colour between them. Since the smoky-brown colour also forms a broad terminal band, which reaches from the apex to the tornus, and in which the stripes are merged posteriorly, it renders the forewings, as a whole, conspicuously dark as compared with any other specimens that I have seen. This individual was received from the late Mr. John E. Robson, by whom it was bred in 1905, from a Hartlepool pupa.—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. December 7th, 1908.

VARIATION OF THE IMAGINAL FORM OF *ARASCHNIA LEVANA* FROM ONE

BATCH OF EGGS.—In July, 1907, I divided with a friend the ova laid in a cage by a (Swiss) female *Arasehnia lerana*. When we returned to England, my larvae were kept in an unheated greenhouse, and pupated, duly emerging in the spring of last year as the form *lerana*. My friend kept his larvae in a warmer house than I did mine, and they pupated quite a fortnight earlier, and all emerged in September as the form *prorsa*, except one individual, which passed the winter in the chrysalis, and emerged in the March following as a typical *lerana*.—W. H. St. QUINTIN, F.E.S., Scampston Hall, Rillington, York. January 17th, 1909.

NOTES ON COLLECTING, Etc.

PAIRING HABIT OF *PETASIA CASSINEA*.—I have frequently found pairs of this species on trunks of trees, but have never noticed the habit referred to by Mr. Rothschild. I think his must have been an exceptional case.—EDWARD GOODWIN, F.E.S., Canon Court, Wateringbury January 25th, 1909.

SCIENTIFIC NOTES AND OBSERVATIONS.

NONAGRIA NEURICA, Hb.=*EDELSTENI*, TUTT (*Ent. Rec.*, xx., p. 164).—At the end of November last, I sent to Mr. Tutt, for publication in the *Entomologist's Record* when space should permit, a note, pointing out that the continuous chain of historic evidence from Hübner's figure, through Treitschke's statement and Schmidt's determination, down to Staudinger's examination of Ochsenheimer's collection, was in favour of the ordinary continental usage of the name *neurica*, and that, therefore, according to the well-known law of priority, Mr. Tutt's new name of *edelsteni* was unnecessary, and should sink as a synonym. As an exhaustive note on the subject (*Ent. Rec.*, xx., 286-293) was already in the printer's hands, and has since been published before space could possibly be found for my note, the last-named would now be out of date, and our editor has very courteously given me an opportunity of substituting something more to the point. As Mr. Tutt objects to being bound in this instance, by history or tradition, the question for him resolves itself practically into that numbered (1) on p. 292—which form does Hübner's figure best represent? That it does not represent either accurately we all agree. But, so far as is at present known, the "white collar" seems less variable than the exact character of longitudinal wing-markings, and Hübner's figure does show the white collar. It is unfortunately slightly misplaced, but would represent no known marking of any form of *arundineta*, Schmidt. The argument from the underside is negative, for, as Mr. Tutt says, it is not shown; and it is just here that I do not consider Treitschke's clear statement beside the mark. Ochsenheimer would probably have seen in Mazzola's collection the very specimen figured by Hübner, but as there is no proof of this, I bow to Mr. Tutt's opinion that capital cannot be made out of it; but the fact that Treitschke mixed up the two species is incontrovertible. I believe some continental authorities who are better acquainted with *edelsteni*, Tutt, than we are, consider that the build of Hübner's figure is nearer to this than to *arundineta*, and Mr. Edelsten has pointed

out to me that the dark hindwings of the said figure may have a further bearing on the determination; in not a few *arundineta* the hindwings are pale enough to show a fairly clear discal dot on the upperside, which is not in Hübner. I am afraid I cannot convince Mr. Tutt, whose mind seems to have been made up from the days when he believed there was only one species, and that Schmidt's differentiations had no validity; but for me, the synonymy will be that of Staudinger's "Catalog," with *edelsteni*, Tutt, added as a synonym to *neurica*, Hüb.—LOUIS B. PROUT, F.E.S. January, 1909.

NONAGRIA NEURICA, Hb.=ARUNDINETA, SCHMIDT.—As the readers of the *Ent. Record* will no doubt be tired of hearing of Hübner's fig. 383 of *neurica*, and as Mr. Prout does not deal with any of the points I consider vital (*Ent. Rec.*, xx., pp. 286 *et seq.*), except that he states that Hübner's figure "does show the white collar unfortunately slightly misplaced," there is no need to deal seriously with the subject further than to say—(1) We have already stated (*antéa*, xx., p. 290) that there is a suspicion that Treitschke had *edelsteni* mixed with his *neurica*. (2) We have already shown that the chain of historic evidence and tradition running through Hübner (1802 and 1818), Ochsenheimer (1816), Treitschke (1825), Duponchel (1840), Boisduval (1840), Herrich-Schäffer (1845), Guenée (1852), and Stainton (1857), agrees with our view, and that the historic chain was broken by Schmidt in 1855, and Staudinger, 1869. (3) We must kindly but firmly disagree with Mr. Prout that Hübner's figure does "show the white collar," even "unfortunately misplaced," and are inclined to think that now, even Mr. Prout will agree with this, since we have both together examined the figure in the copy of Hübner, in the Library of the Natural History Museum, South Kensington. In this copy the thorax is well drawn, the prothoracic "collar" distinct, and of the brown ground colour (not white); the patagia well-marked, and of the ground colour; the scaling of the mesothorax dark in front, with a pale transverse mark behind this medially, the rest of the meso- and the metathorax also of the ground colour. We do not even think Mr. Prout will now urge that this mesothoracic mark has any connection with the well-defined prothoracic collar of Hübner's figure, or that of our *edelsteni*. The figure in this copy of Hübner also shows no trace of the three white dots along the wing, but has the well-defined dark, pale-encircled *arundineta* reniform. (4) We have examples of *arundineta* without the slightest trace of a discal dot on the upperside of the hindwings. Until someone can really find the "white collar" depicted, in the sense the words mean, and the characteristic wing-markings of *edelsteni*, in Hübner's figure, and show that the reniform depicted is that of *edelsteni*, and not that of *arundineta*, we must insist that *neurica*, Hb.=*arundineta*, Schmidt, that the name *neurica* is applicable to our specimens from Cambridge, Norfolk, Essex, etc., and that the new species from Sussex has no other name applicable except *edelsteni*. We shall be glad now in the interest of our readers, to give the matter a rest in our journal, as enough has been written to enable those interested to study the facts quite for themselves.—J. W. TUTT.

CURRENT NOTES.

At the Annual Meeting of the Entom. Society of London, held on

January 20th, the outgoing President, Mr. C. O. Waterhouse, took as the subject of his address, "The Claws of Insects." After briefly describing the various forms of insects' claws which he classified as toothed, appendiculate, bifid, and pectinate, and having given examples of each, he suggested as a subject for investigation that he hoped entomologists would take up as a study, "Are these forms of claws merely the result of heredity without any special object, or is there evidence to show that the different forms are adapted to particular modes of life, in fact, have been developed to meet special needs?" He then proceeded to show by numerous examples that closely allied species often had dissimilar claws; that insects with quite different habits had the same form of claws; and that others with different forms of claw seemed to have the same habits. The question therefore appeared to be still an open one requiring careful investigation, and he appealed for more field observation with a view to solve this and many other problems.

We have received an advance copy of the "Handbook of Richmond Park,"* which contains lists of the fauna and flora of the Park. The book is very interesting and very well got up, with three beautiful photographs by the author, the early history, and every information concerning the Park. There is in it a plan of the park in the time of Charles I., and also a fine large, new and authentic map. In the insects, the dragonflies are from some records by Mr. W. J. Lucas. A few *Proctotrupidae* and gnats captured by Mr. C. O. Waterhouse are mentioned. The beetles are by Mr. H. St. J. Donisthorpe, and comprise a very fine list of all the better and more interesting species that have ever been taken in the Park, a most useful list to the coleopterist. The butterflies of which there are very few now, include some records by Mr. A. Sich. The moths (the list of which is very incomplete) include some of the historical captures of the late Major Ficklin.

Mr. E. A. Newbery describes (*Ent. Mo. Mag.*) a little Staphylinid, from examples taken at Great Salkeld, by Mr. Britten, as new to science, under the name of *Thinobius pallidus*, and Mr. Champion adds *Homalota (Aeronota) parens*, Muls. et Rey, to the British list from a specimen having been taken near Guildford. Mr. Fryer adds *Bledius denticollis*, Fauvel, from specimens taken at Nethy Bridge.

Mr. J. Edwards records *Idiocerus rutilans*, Kehbm., as a British insect, captured at Oxshott and Wisley on sallow, by Mr. W. West. He also states that recent authorities are wrong in uniting this insect with *I. elegans*, Flor.

The officers and council of the South London Entomological and Natural History Society for the year 1909 are as follows:—*President*: A. Sich, F.E.S. *Vice-Presidents*: R. Adkin, F.E.S., W. J. Kaye, F.E.S. *Treasurer*: T. W. Hall, F.E.S. *Librarian*: A. W. Dodds. *Curator*: W. West (Greenwich). *Hon. Secretaries*: Stanley Edwards, F.L.S., etc. (Corresponding), H. J. Turner, F.E.S. (Report). *Council*: S. R. Ashby, F.E.S., E. C. Joy, A. M. Montgomery, H. Main, F.E.S., A. L. Rayward, F.E.S., R. South, F.E.S., A. E. Tonge, F.E.S. It will be observed that Mr. A. Sich has been re-elected for a second term as President of the Society.

* "The Handbook of Richmond Park, A Guide, Description and History," by Coryn de Vere [Knapp, Drewett and Sons, 30, Victoria Street, Westminster, S.W.].

In the *Entomologischen Blättern Schurabach*, iv., no. 5, May, 1908, Herr Oberpostrat Formànek describes a new genus and species of Scolytid beetle, which he calls *Cryphaloïdes donisthorpei*, from specimens taken by Mr. Donisthorpe in one of the hot-houses in the Royal Botanic Gardens at Kew.

At the Annual Meeting of the Lancashire and Cheshire Entomological Society, held December 21st, 1908, the following were elected officers and council for 1909:—*President*: S. J. Capper, F.E.S. *Vice-Presidents*: H. H. Corbett, M.R.C.S., Wm. Mansbridge, F.E.S., E. R. Bankes, M.A., F.E.S., Robert Newstead, M.Sc., F.E.S., W. J. Lucas, B.A., F.E.S., and C. E. Stott. *Treasurer*: J. Cotton, M.R.C.S., F.E.S. *Secretaries*: H. R. Sweeting, M.A., Wm. Mansbridge. *Librarian*: F. N. Pierce, F.E.S. *Council*: J. Collins, R. Wilding, O. Whittaker, Wm. Bell, M.R.C.S., J.P., E. G. Bayford, F.E.S., P. F. Tinne, M.A., M.B., W. D. Harrison, W. A. Tyerman, E. J. P. Sopp, F.R.Met.S., Wm. Webster, M.R.S.A.I., Geo. Arnold, F.E.S., and Wm. Mallinson.

The last meeting of the Entomological Club was held in the "Entomological Salon" of the Holborn Restaurant, on the evening of January 19th, when Mr. G. H. Verrall was the host. The invited guests began to arrive shortly before 7 p.m., and by 8 p.m., a large number was present, the informal meeting lasting from 7 p.m., till 8.30 p.m. During this time many old friendships were renewed, many entomological, and other, matters discussed, and the host heartily congratulated on this, the 22nd meeting over which he had presided. We were interested in seeing that the second volume of Mr. Verrall's chef d'œuvre on "British Diptera" was now completed. At 8.30 p.m., supper was served, and a large number of members and guests sat down. These included among others—Rev. E. N. Bloomfield, Rev. F. Morice, Rev. C. Thornewill, Drs. T. A. Chapman, F. A. Dixey, N. H. Joy, and K. Jordan, Messrs. H. J. Adams, R. Adkin, H. W. Andrews, Austen, P. J. Barraud, M. F. Bliss, F. Bouskell, Bryden, M. Burr, A. Cant, G. C. Champion, F. Noad Clark, J. E. Collin, W. E. Collinge, W. L. Distant, H. St. J. K. Donisthorpe, Hamilton H. C. Druce, S. Edwards, C. Fenn, N. P. Fenwick, C. Gahan, T. W. Hall, A. Harrison, F. Heron, Selwyn Image, Oliver Janson, P. H. Jackson, F. B. Jennings, A. H. Jones, W. J. Kaye, W. F. Kirby, R. Wylie Lloyd, W. Lucas, H. Main, Guy A. K. Marshall, C. Morley, W. E. Nicholson, H. E. Page, H. Sauzé, W. E. Sharp, W. G. Sheldon, A. Sich, Skinner, A. J. Scolliek, R. South, E. Step, Tathom, J. R. le B. Tomlin, A. Tonge, J. H. Tutt, J. W. Tutt, W. F. Tutt, H. J. Turner, C. J. Wainwright, J. J. Walker, E. A. Waterhouse, F. H. Waterhouse, etc.

A comprehensive and excellent menu having been in due course negotiated, the host proposed the toast of the "Entomological Club." Allowing himself a little more freedom than usual, he gave a very interesting resumé of the origin and functions of the Club, and claimed, amid cheers, that it had done much to promote kindly personal feelings between individuals engaged in the various branches of entomological study. He begged, for the little worked orders, a larger share of students than they had hitherto obtained, and trusted that he would be able to welcome the guests present at many more such functions.

Dr. Dixey proposed the health of "our host" in enlogistic, and well-chosen, terms, thanking him, in the name of the guests, for his generous kindness and hospitality, the whole of the company joining in the "musical honours" which he suggested should be accorded to "our host."

Mr. Verrall suitably replied, and incidentally noted that a memoir was being prepared of all the known members of the club, which included some of the best-remembered names in British entomology. He asked that any known details of any previous members should be sent to Mr. South, the Secretary, for inclusion into the memoirs that were being thus compiled. The members began to disperse about 10 p.m., but it was nearly two hours later before the more convivial and more happily-situated, as to the nearness of their abiding-places for the night, finally dispersed.

The following Fellows were elected as the officers and council of the Entomological Society of London for the session 1909-10, at the meeting held January 20th, 1909:—*President*: Frederick Augustus Dixey, M.A., M.D. *Treasurer*: Albert Hugh Jones. *Secretaries*: Henry Rowland-Brown, M.A., Commander James J. Walker, M.A., R.N., F.L.S. *Librarian*: George Charles Champion, F.Z.S. *Council*: Thomas Algernon Chapman, M.D., F.Z.S., Albert Harrison, F.L.S., F.C.S., Selwyn Image, M.A., Karl Jordan, Ph.D., George Blundell Longstaff, M.D., Hugh Main, B.Sc., Guy Anstruther Knox Marshall, Professor Edward B. Poulton, D.Sc., M.A., F.R.S., Robert Shelford, M.A., F.L.S., C.M.Z.S., Roland E. Turner, James W. Tutt, Charles Owen Waterhouse. We are informed that, in our note (*antea*, vol. xx., p. 307), Dr. Longstaff and Mr. R. Turner should have been returned as resident London members.

After the annual meeting the resignation of Professor E. B. Poulton having been accepted, the new council unanimously elected Professor T. Hudson-Beare to fill the vacancy.

The president has since chosen Dr. Karl Jordan, Dr. G. B. Longstaff, and Mr. C. O. Waterhouse to be Vice-Presidents.

The students' rooms at the Natural History Museum, South Kensington, having been fitted with new heating apparatus the collections are again available for reference and study. It appears to us that the rooms are now a great deal more comfortable than heretofore.

We are pleased to note that the presidency of the Yorkshire Naturalists' Field Club for 1909, has been offered to, and accepted by, Mr. W. H. St. Quintin, J.P., F.E.S., etc.

Dr. J. H. Wood describes further new species of *Phora* (*Ent. Mo. Mag.*), viz., *Phora armata*, *P. rufis*, *P. aequalis*, *P. flavescens*, *P. longiseta*, *P. riralis*, *P. surdifrons*, *P. parra*, *P. mallochi*, *P. glabriifrons*, *P. propinqua*, *P. uliginosa*, *P. collini*. Mr. Malloch also describes a new species as *Phora fumata*.

Mr. E. A. Butler describes an insect that has long been considered a form of *Myrmecopora urida*, Er., as a new species under the name of *M. breipes*. He records the former from the Isle of Wight (whence came Erichson's type), and the latter from Tintagel, Plymouth, Slapton, and Dawlish. This latter (smaller) insect, Deville says, also occurs in Jersey and Brittany. *M. urida* is also noted from Whits-table, Upnor, Shoreham, Hayling Island, and Camber, near Rye.

Mr. Champion adds *Homalota füssi*, Bernh. (= *nitens*, Fuss. *nec*

Makl.) to the British list, on the strength of a specimen taken at Mickleham, on September 5th, 1875.

Mr. Bagnall describes the yellow orchid thrips (*Ent. Mo. Mag.*), under the name of *Anapothrips orchidaceus*, noting that it is injurious to various hothouse orchids.

The *Transactions of the Nat. Hist. of Northumberland, Durham, etc.*, vol. iii., pt. 1, contains an important illustrated paper by Mr. Bagnall, "On some new genera and species of *Thysanoptera*," whilst Lieut.-Col. C. H. E. Adamson, gives the completion of an annotated "Catalogue of Butterflies collected in Burmah up to the end of 1895." In the light of recent discoveries concerning the species of *Celastrina* and *Everes* occurring in these districts, it would be well if the specimens referred to in these groups were re-examined, and their exact species determined.

Having completed (and published in parts i., ii., and iii., of our new series of *British Butterflies*) a review of the Everid section of butterflies, and the detailed life-history and distribution of *Everes argiades*, and further completed, as far as possible, our account of *Cupido minimus*, we find ourselves absolutely wanting a "pupa" (dead) or "pupal shell" of this last-named species. Has anyone one that can be loaned to us for detailed description? If so, we shall be very grateful.

Has anyone any really good photographs of aberrations of *Cupido minimus* and *Plebeius aegeron* worth publishing, and that might be loaned to us for the purpose?

The collection of Mr. Schill was sold at Stevens' Auction Rooms on January 26th. Prices ruled rather low but for a few exceptionally rare specimens. A suffused specimen of *Rumicia phaea* produced 10s., an example of what is erroneously termed ab. *schmidii* 17s., and six other aberrations, 22s. A large ♂ *Chrysophanus dispar* produced £1 15s., another ♂ £1 2s., a ♀ £4, and a ♂, reputed to have been captured at "Seal Park," from the "Tugwell Coll." and the British origin of which must be open to the gravest doubt, produced £2, whilst a pair of *Cyaniris semiargus* from the "Briggs' Coll." fetched 10s. Of *Arctia caia*, a pair described as having golden hindwings produced 18s., whilst the difference in condition of the two pairs of *Laelia coenosa*, made their prices 30s. and 14s. respectively. A fine ♂ *Agrotis subrosea* produced £5, whilst two poor ♂s went for 22s. With the exception of two fine aberrations of *Dryas paphia*, bred by Mr. Newman in 1908, and both slightly deformed, which produced £2 and £5 respectively, nothing else appears to call for comment.

A most interesting paper on the "Ants found in Great Britain," by Mr. H. St. J. K. Donisthorpe, has just been placed in our hands. It is largely concerned with the habits of these insects, and is a most instructive and thoroughly useful summary. It was read before section F of the Leicester Literary Society in June last, and is published in the *Transactions* of this Society.

At the meeting of the South London Entom. Society held on January 14th, 1909, Prof. W. Bateson, F.R.S., gave an illustrated lantern lecture on "Mendelism."

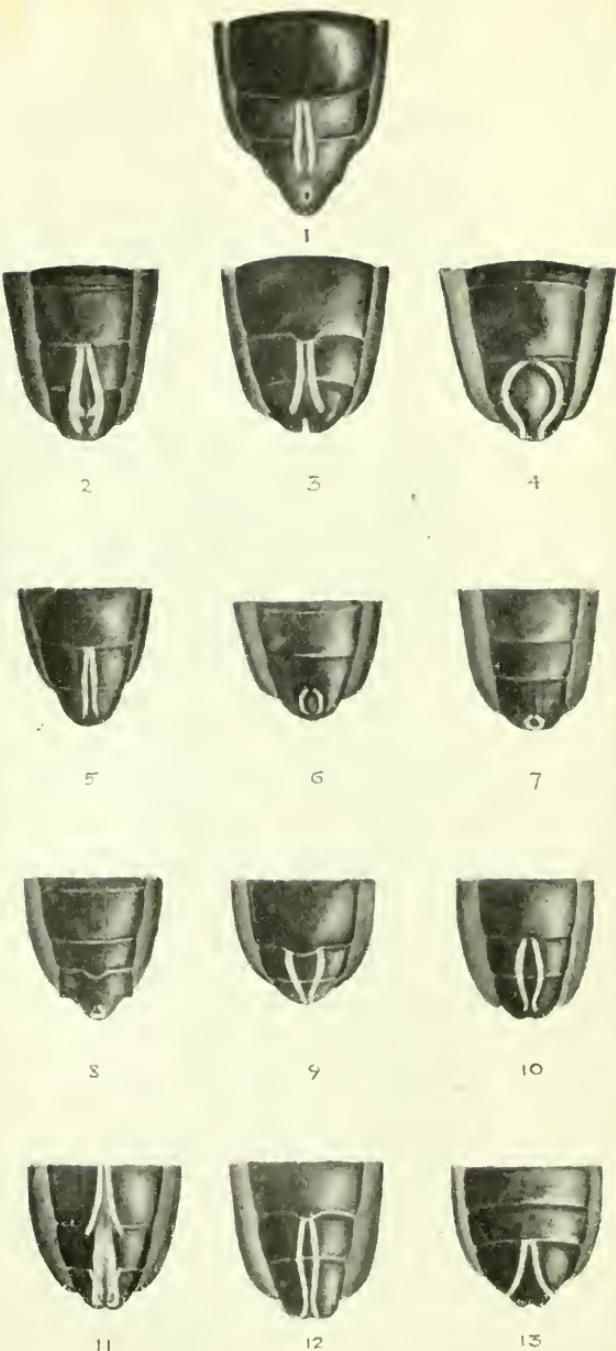
At the meeting of the Lancashire and Cheshire Entom. Society, held on January 18th, 1909, Mr. Mansbridge exhibited examples of *Paedisca naerana* and *P. geminana*, bred last season from holly and

bilberry respectively; the genitalia of these were exhibited under the microscope by Mr. F. N. Pierce, but no difference between them could be observed, excepting the loss of certain fugitive hair-tufts by *P. geminana*.

At the same meeting, Mr. F. N. Pierce exhibited a series of the "Carnades group" of the Agrotids, which includes our British *Agrotis tritici*, etc. Mr. Pierce stated that he had now been able to differentiate, with perfect clearness and constancy by means of the genitalia, four of the British species in the group, viz., *Agrotis cursoria*, *A. nigricans*, *A. obelisca*, and *A. tritici* (with *aquilina*). He also showed the genitalia of two specimens, and the wing-portions of one of them, which he believed would ultimately prove either an unrecognised species, or the "true *aquilina*." Mr. Pierce illustrated his remarks by preparations shown under the microscope. It does not appear in what manner Mr. Pierce defines the "true *aquilina*." If the genitalia support the *aquilina* of Godart, as a form of *A. tritici* (as in *British Noctuae and their Varieties*, vol. ii., pp. 54 *et seq.*), it is difficult to know what other *aquilina* is meant. If this be a fifth species, it would be really interesting to know whether it is referable to Godart's insect, or to Hübner's *fictilis*, the insect to which our less informed lepidopterists usually refer when they speak of *aquilina*. One suspects, however, that these are all really forms of *Agrotis tritici*, and that the possible fifth species certainly has nothing to do with *aquilina*, Godt., or *fictilis*, Hb., both common insects in the east and south of England. We shall certainly have cause to congratulate Mr. Pierce if he clearly determines another species in this interesting group.

SOCIETIES.

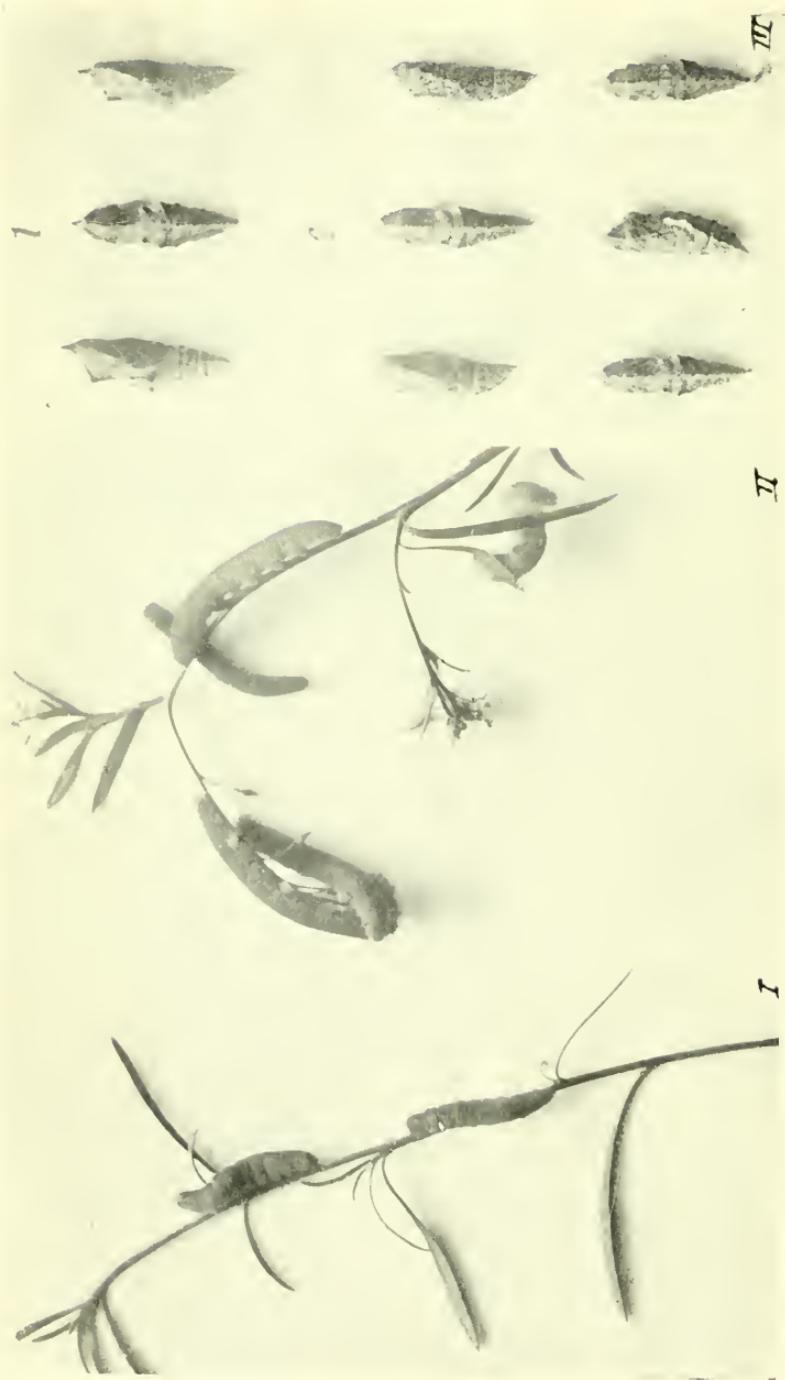
CITY OF LONDON ENTOMOLOGICAL SOCIETY.—January 5th, 1909.—
 EXHIBITS: *CIDARIA RETICULATA*—A series bred from Windermere pupæ, the imagines emerging between July 18th-31st, 1908, Mr. H. M. Edelsten. *COENONYMPHA TIPHON* var. *ROTHLIEBI* from Witherslack; *ENODIA HYPERANTHUS* ab. *OBSOLETA*, from various English and Scotch localities; *COENONYMPHA PAMPHILUS*, a series including specimens without ocellated spots on the upperside of forewings, Dr. G. C. C. Hodgson. *PHRYXUS LIVORNICA* taken at Torquay in June, 1906, by Mr. H. Terry, Mr. A. W. Mera. *RUMICIA PHLEAS*, a specimen with black hindwings, Darenth Wood, July, 1908, and another with straw-coloured marginal band on left hindwing, Bexley, August, 1908, Mr. V. E. Shaw. January 19th, 1909. *NOTOLOPHUS GONOSTIGMA*, pale ♀, *XYLOPHASIA POLYODON* (*MONOGLYPHA*), a melanic specimen taken at Mucking in July, 1908. *COSMOTRICHES POTATORIA* ab. *BEROLINENSIS* ♂, and ab. *INTERMEDIA* ♂, bred from Mucking larvæ, the ab. *berolinensis* emerging July 11th, 1908, Rev. C. R. N. Burrows. *CALOCAMPA EXOLETA*, and *C. VETUSTA*, varied series from Inches, N.B., 1908, Mr. Leach. *ABRAXAS GROSSULARIATA* ab. *VARLEYATA*, one of a second-brood of 31 specimens, of which seven were of this variety, the brood being raised from typical parents, themselves the progeny of a cross between ab. *VARLEYATA* and a typical specimen, Mr. L. W. Newman. *MELANIPPE FLUCTUATA*, with the central band carried uniformly across the whole width of the upperwings, Bexley, June, 1908, Mr. V. E. Shaw. *BUPALAS PINIARIA*, a gynandromorphous specimen, ♂ right side, ♀ left side—wings and antennæ—taken at Oxshott, June 6th, 1898, Mr. H. B. Williams.



Del. H. C. Dollman.

MALE APPENDAGES OF THE SPECIES OF THE GENUS ANASPIS.

The Entomologist's Record, etc., 1909.



The Entomologist's Record, etc., 1909.

LARVA AND PUPA OF *PIERIS RAPAE* AND *P. MANNI*.

Photo, H. Powell.

I. Larva of *Pieris rapae*. II. Larva of *Pieris rapae*. III. Larva of (1) *Pieris rapae* (2) *Pieris mannii*.

Spring butterflies in the Rhone Valley.

By A. S. TETLEY, M.A.

A few notes on a short excursion into the Rhone Valley during the first fortnight of June, 1908, may prove of interest in comparison with those on a similar tour undertaken in the latter half of May, 1907. The past season, at any rate in the early months, seemed to be, if anything, a forward one in Valais. It was certainly very much in advance of 1907. The early "blues" and "skippers," which were quite fresh (even *Nomiades cyllarus*) at the end of May, 1907, were worn out, or had entirely disappeared from the same localities in the beginning of June, 1908.

Accompanied by a friend who was very keen on adding to his herbarium, I went straight through to Chexbres, which we chose as our first resting-place, to visit an old colleague. The next day, June 5th, we spent very quietly on the western side of Mt. Pélérin. As we strolled along the road out of Chexbres village, the sight of *Melanargia galatea* in perfect condition warned us that the early spring butterflies were over. A piece of marshy ground, a few yards further on, tempted us to stay, and, with one eye on some peasants near at hand, we plunged in after some very obvious Brenthids which proved to be *Brenthis ino*, just out. In one corner of the little marsh, we found *Lycaena aeras*, a rather small form, in fact, at first I had passed them as *Tanagra atrata*; two males taken measured 28mm., and one female 27mm., two other females being more normal in size. Oddly enough, on returning about 3 p.m., when the sun was still bright on the ground, we could not find a single specimen. Butterflies were numerous as we pushed up the lower slopes of the mountain. *Polyommatus alexis* was far and away the commonest "blue," and next to it came *Agriades bellargus* and *Nomiades semiargus*, the latter worn. *Hesperia malrae*, *Powelli sao*, *Nisoniades tages*, *Nemeobius lucina*, the "swallow tails," *Brenthis dia*, *Melitaea aurinia*, *M. parthenie*, and *Erebia medusa*, were all much past their prime. *Chrysophanus hippothoë* was just out in the meadows, and I took one *Melitaea didyma*, a large fresh ♀.

The next day we went on to St. Maurice where we stayed till June 11th. We worked through Lavey Woods to Bex and up to Frenières, but clouds came up at midday and heavy rain began at 3.30. Butterflies seemed scarce all day. In the woods we saw or took two *Cyclopides palaeomon*, *Hesperia malrae* ab. *taras*, lots of fresh *Aporia crataegi*, *Iphiclides podalirius* (all worn), *Limenitis camilla*, *Epinephele jurtina* 1 ♂, *Coenonympha iphis* 1 ♂, and, most of the ordinary spring butterflies. Near Frenières a single *Lycaena arion* brought our entomological work to an end, and between the showers, we returned to botany. During the night the temperature fell between 30° F. to 40° F., so we were not very hopeful when next morning, under dull skies, we tramped along the river to St. Triphon. Nothing would stir, though we got wet through as we kicked our way through the herbage. From St. Triphon we took train to Villeneuve and spent the afternoon in the marshy ground at the river-mouth. We managed to rouse up a lot of *Aphantopus hyperanthus* and *Augiades sylvanus*, but much searching near Les Grangettes produced no *Brenthis selene*, though the ground and the vegetation were very like those of our Yorkshire localities.

June 8th found us at Martigny, but dull cold weather spoiled every-MARCH 15TH, 1909.

thing. A few gleams of morning sun produced *Brenthis daphne* and a single *Nordmannia (Thecla) ilicis*, and *Hesperia carthami* flew occasionally on the rocks of La Bâtiáz, and a single *Polyommatus amanda* in the marshes below only raised vain hopes. On June 9th, with warmer weather, we made for the mountains behind Bex to see if we could light on *Loreia amphidamas*. When we got to Villars all was dull and misty, so we worked down to the lower ground which we could see bathed in sunshine. In the meadows *Melitaea athalia* was in perfect condition, but *M. parthenie* was generally very worn. Along the banks of the Gryonne, *Pararge maera* was extremely abundant, and single specimens of *Cupido sebrus* and *Nisoniades cyllarus*, worn to shreds, recalled to mind their abundance in that place last year. *Melanargia galathea* now swarmed everywhere, and, in some marshy ground close to the railway, we took a few *Coenonympha iphis*. Next day (June 10th) we decided to go to the famous "undercliff" at Vernayaz. Favoured by brilliant sunshine we had one of our two best days. Just outside the station gates *Loreia* var. *gordinus* turned up as if to encourage our hopes. All along the path under the cliff's butterflies were swarming. One big bramble bush in full flower I shall never forget. It was literally covered with *Brenthis daphne*, and *Loreia* var. *gordinus*, with *Nordmannia (Thecla) ilicis* a very bad third. Up and down the path worn *Melitaea cinxia* flew along with *M. phoebe* and half a dozen common "blues." I was surprised to take three *Erynnis (Carcharodus) laraterae* so early. But it was a day of surprises. I took a single very worn *Parnassius mnemosyne* and a perfectly fresh *Erebia stygme*: but, later in the day, as we were nearing Martigny, a strange-looking butterfly suddenly flew off one of the large boulders that are so frequent there. It reminded me of *Hipparchia semele* in flight and appearance, and a lucky shot disclosed *Oeneis aello*, a ragged old male, but unmistakable. One *Argynnis adippe* ♂ fell to the net while we were in the marshes after *Polyommatus amanda*. The latter was freshly out, but all males. We took all suspicious-looking *Melitaeas*, and worked hard round La Bâtiáz for *M. var. berisalensis*, but got no more than two. *Aporia crataegi* was very common; I counted eight at rest in the late afternoon on a single scabious head. *Melitaea dictyna* was also very abundant in the marshy ground.

The next day we went to Bérisal, after a morning in the Lavey woods, when we added *Brenthis ino* to our record there. June 12th to 14th were spent near Bérisal. Above the village, butterflies were scarce. *Pararge hiera* was common just below the hotel, and all along the road up to the fourth refuge. *Nisoniades tages* kept up nearly to the top of the pass along with *Cupido minimus* and *Iphiclides* var. *bryoniae*. But down in the Gantertal there were butterflies in abundance. *Hesperia carthami* was the commonest "skipper," but there were plenty of others, including *H. serratulae*, difficult to get in good order, *Powelliia sao* quite fresh, *Nisoniades tages*, and *H. malrae*. *Parnassius mnemosyne* was very common in its well-known haunt, nearly all males; there also were *Aricia eumedon* and *Anthocharis simponia*, the latter much easier to catch in the early morning than later in the day. I was glad to find *Plebeius lycidas* in some numbers at the second refuge, and well out, too, both ♂ and ♀; odd specimens occurred along the road as we went down. *Erebia erias* occurred sparingly from the second refuge upwards to Bérisal, and again below Simplon Dorf for a mile or two. *Iphiclides napi* var. *bryoniae* seemed to begin at Bérisal,

and was commonest just above the hotel. *Oeneis aello* occurred at the Ganter Bridge, along the road above Bérusal, and again below the old Hospice. *Scolitantides baton* we took twice below the village. *Melitaea phoebe* was just emerging, but *M. cinxia* was common, and in fine condition. Other newcomers included *Lycaena arion* and var. *obscura*, *Coenonympha* var. *darwiniana*, *Plebeius argyrogynomon*, and one *Melitaea aurclia*.

On June 15th we walked over the pass to Iselle. There were very few butterflies until we reached Gondo. Just below that place, in a meadow on the right of the road, *Parnassius mnemosyne* turned up again, but very worn. Along with it were numerous "blues," including one specimen of *Scolitantides orion*. *Aporia crataegi* reappeared at Gondo, and large numbers of *Aglais urticae*. From Iselle I travelled straight back to England, leaving my more fortunate friend at Visp en route for Saas Fee. On the 16th he spent some hours in the neighbourhood of Stalden, whence he sent me a number of butterflies, among which were two undoubted *Melitaea* var. *berisalensis*. At Saas Fee broken weather and the high altitude combined to render his remaining week of no account entomologically.

The complete list of butterflies seen or taken is as follows:—*Erynnis (Carcharodus) laratereae*, *Hesperia carthami*, *H. alveus*, *H. serratulae*, *H. malvae* and ab. *taras*, *Powelli sao*, *Nisoniades tages*, *Augiades sylvanus*, *Adopaea flara*, *A. lineola*, *Cyclopides palaemon*, *Chrysophanus hippothoe*, *Lowelia aleiphron* var. *gordius*, *L. dorilis*, *Rumicita phlaeas* (once) *Lycaena arcas*, *L. arion*, *Polyommatus amanda*, *Cupido minimus*, *C. sebrus*, *Cyaniris semiargus*, *Nomiades cyllarus*, *Aricia eumedon*, *A. astrarche*, *Agriades bellargus*, *Polyommatus hylas*, *P. alexis*, *Scolitantides baton*, *S. orion*, *Plebeius* var. *lycidas*, *P. argus*, *P. argyrogynomon*, *Celastrina argiolus*, *Callophrys rubi*, *Thecla ilicis*, *Nemeobius lucina*, *Iphiclidess podalirius*, *Papilio machaon*, *Parnassius apollo*, *P. mnemosyne*, *Aporia crataegi*, *Pieris brassicae*, *P. rapae*, *P. napi* and var. *bryoniae*, *Anthocharis simplonia*, *Euchloë cardamines*, *Leptosia sinapis*, *Colias hyale*, *C. edusa* (Stalden), *Gonopteryx rhamni*, *Argynnis adippe*, *A. niobe* (Stalden), *Issoria lathonia*, *Brenthis euphrosyne*, *B. daphne*, *B. ino*, *B. dia*, *Melitaea aurinia*, *M. phoebe*, *M. cinxia*, *M. didyma*, *M. var. berisalensis*, *M. aurelia*, *M. parthenie*, *M. athalia*, *M. dictyna*, *Pyrameis cardui*, *P. atalanta*, *Euanessa antiopa*, *Vanessa io*, *Aglais urticae*, *Eugonia polychloros* (larvæ), *Polygonia c-album*, *Limenitis camilla*, *Pararge maera*, *P. hiera*, *P. megaera*, *P. egeria*, *Epinephelaeurtina*, *Aphantopus hyperanthus*, *Coenonympha iphis*, *C. var. darwiniana*, *C. pamphilus*, *Oeneis aello*, *Erebia epiaphron* (Saas-tal), *E. medusa*, *E. stygine* (once), *E. erias*, *Melanargia galatea*—in all eighty-nine species.

Lepidopterological Notes for 1908.

By PERCY C. REID.

The *Entomologist's Record* is now-a-days so horribly scientific, and so full of specialised work, that the ordinary out-of-doors collector, who derives his pleasure from merely watching Nature on a bright summer's day, and who is guilty of collecting for collecting's sake, becomes diffident of occupying your space, and of wearying your

advanced readers* by a record of what he is pleased to call his "season's work."

As, however, for several years past you have been good enough to find space for my annual record, I am tempted to try once again, in the hopes that there are still, perhaps, some novices who may be interested, and possibly some few scientists who may find a few grains of wheat amidst my bushel of chaff.

I commenced the year with a fair quantity of pupæ from the preceding summer, and I see from my diary that my first active work was a trip to the Isle of Portland towards the end of February, but the wind blew, and the rain fell in torrents, so that searching for larvæ was anything but pleasant. However, I made a fair bag, which resulted in due course, in a number of *Noctua xanthographa*, a few very pretty *Heliothis hispidus*, and some *Epunda lichenaea*, with one *Triphaena subseqna*.

Tephrosia bistortata began to emerge on February 29th, and *Nyssia lapponica* (1906 larvæ) on March 15th. On March 24th I got a pairing of these latter, 24 hours after the emergence of the ♂, and just about dusk in the evening.

At the end of March, a friend and myself spent a couple of days on the Sussex downs looking for larvæ of *Egeria sphegiformis* and our bag was about three dozen, but most of them proved to be "stung," so that the result was poor. During April I tried for *E. sphegiformis* and *E. formiciformis* near here, getting some half-dozen of the former, but only one or two of the latter, which is one of the most difficult larvæ, in my estimation, to find. The osiers hereabouts are riddled by a beetle, the frass of which persists in catching the eye, while the clear-wing seems to make little or no visible frass. Larvæ of *Egeria culiciformis* and *E. cynipiformis* were common, and easy to find.

Eupithecia abbreviata began to emerge soon after the middle of the month, as well as *E. pumilata*, while the first *E. coronata* appeared on the 30th. Early in May I obtained a fair number of larvæ of *Cirrohoedia verampelina*, and captured a few *Aleucis pictaria* and *Anticlea derivata*. On May 14th I found larvæ of *Eupithecia debiliata* common on bilberry in Kent, with many larvæ of *Hypsipetes elutata* and *Boarmia repandata*. The undergrowth of some of the woods here is largely composed of lime, and by beating this I found quantities of larvæ of *Tiliacea citrago*, with far less trouble than searching large trees.

Towards the end of the month (as already noticed in the *Ent. Rec.*) I found larvæ of *Citria cerago* and *Mellinia gilcago* feeding in poplar catkins. At this time *Clostera reclusa*, *Lobophora hexapterata*, and *Eupithecia rufogata* were emerging. I beat some very small larvæ from flowers of *Anthriscus sylvestris*, which eventually proved to be those of *Amphipyra tragopogonis*, and made a trip into Norfolk, which proved very successful, in search of larvæ of *Eupithecia subciliata*. Although we have quantities of flowering maples here, and the insect is said to occur wherever the maple is large enough to flower, I have never

* We sincerely hope that our contributors do not think this. Our trouble is to get notes of the character that Mr. Reid and a few other of our contributors regularly write for us, and we can assure such that, far from their notes wearying us, we are fully alive to the fact that quite two-thirds of our readers still prefer these notes to anything else published. The difficulty is to get such contributions.
—ED.

succeeded in finding it in this locality. A visit to the Suffolk haunts of *Fidonia conspicuata* was again a failure, and I fear the insect is quite extinct. *Pharetra menyanthidis* was now beginning to appear with *Eupithecia castigata* from goldenrod in Sussex, and *E. subumbrata* from *Pastinaca sativa* in Kent. These latter I had mistaken as larvae of, and had recorded as, *E. pimpinellata*, though strangely enough one single *E. pimpinellata* did emerge later on from a *P. sativa* larva. Larvae of *Cleoceris riminalis* were common on sallow in the woods, and of *Tethea substusa* on the aspens. *Arctomyces myricae*, *Cymatophora* or, and *Amphidasya betularius*, emerged at the beginning of June, and I found *Epione adrenaria*, *Acidalia remutaria*, and *Iodis lactearia* common in woods in Kent. Some larvae of *Petasia cassinea* finished feeding about June 10th. On the 16th I bagged two *Erastria venustula*, in one of their known localities, and on the 19th, two more. In each case they occurred between 7.45 and 8.15 p.m. On the latter date, six *Cucullia gnaphalii* emerged, but though I tried hard I could not get them to pair.

Having come across an old record of larvae of *Eupithecia consignata*, on hawthorn, I journeyed on June 20th to a locality from which a recent capture had been recorded, and was successful in beating about a dozen-and-a-half, which I hope will emerge during this spring. I fancy hawthorn on chalk would be worth trying for this larva, though mine were not from a chalky district. Larvae of *Cucullia chamomillae* were fairly plentiful in some of my fields, while those of *Asphalia floricornis*, *Brephos parthenias*, *Notodonta ziczac*, *Drepana falcataria*, and *Platypteryx lacertinaria* occurred freely on birch in the woods.

At sugar *Miana strigilis*, *M. furuncula*, *Agrotis segetum*, etc., were abundant, and I was fortunate enough to take two ♀ *Cymatophora ocularis*, both of which I kept for ova, and successfully.

Towards the end of June, I paid a visit to the *Acidalia immorata* ground near Lewes, and took several ♂s and two ♀s, which gave me plenty of ova. I took also a few larvae of *Nonagria geminipuncta*, which gives a dark form hereabouts, and found larvae of *Porthesia chrysorrhoea* plentiful.

Collix sparsata and *Eupithecia debiliata* began to emerge on June 29th, and also one *Acidalia incanaria* from bilberry. *A. rusticata*, *A. incanaria*, *A. dilutaria*, and *Eupithecia tenuiata* resulted from a trip to Kent on July 1st, and *Acidalia rubricata*, *Agrophila trabealis*, and a few small larvae of *Dianthoecia irregularis* from a trip to Tuddenham the next day.

On July 4th and 5th, a friend and myself bagged two dozen *Leucania faricolor*, several *Mamestra abjecta* and *Acidalia emutaria* on our Essex coast, but we were quite late enough, and some were beginning to lose their condition.

Eupithecia trisignaria (from *P. sativa*) and *Egeria andrenaeformis*, emerged on July 7th, followed shortly by *Cleoceris riminalis*, *Collix sparsata*, and *Eupithecia sobrinata*.

On July 25th I went to Deal, and found *Acidalia ochrata* and *Lithosia pygmaeola* very common. At the end of the month *Eupithecia subciliata* were coming out freely, while beating ash in early August, resulted in plenty of larvae of *Ennomos fuscantaria*, a few *Eupithecia fraxinata*, and I think one or two *Selenia illustraria*. I went, on August 14th, to try for *Larentia olivata* and *Gnophos obscurata*. The

former were well past their prime, but the latter were in good condition. For the next month I was occupied with other matters, but *Ennomos fuscantaria*, *Cirrhoedia xerampelina*, *Citria citrago*, kept emerging, and I beat a few *Leiocampa dictaeoides*, *Drepana falcataria*, and *Platypteryx lacertinaria* from birch in this neighbourhood. On September 2nd, I accompanied a friend to the Norfolk coast, where we found larvae of *Eupithecia extensaria* in numbers. *Tiliacea aurago* (a very scarce insect here) came to ivy blossom in my garden on September 23rd. Towards the end of October *Petasia cassinea* emerged well. Out of eighteen larvae I bred fourteen imagines, and of these only two were crippled. I pupated them in a rhubarb-pot filled with earth, in which they could burrow as deeply as they liked. A few *Poecilocampa populi*, *Hybernia aurantiaria*, and *H. defoliaria* finished what had been, on the whole, a very fairly good year for insects.

Trichopteryx intermedia, Gillm., var. thomsoni, I. B. Ericson, a British species.

By HORACE DONISTHORPE, F.Z.S., F.E.S.

My friend, Professor Beare and I, took this species in some numbers at Newtonmore, N.B., in June, 1907, by beating fir-tops. I also took two specimens in the débris of a nest of *Formica sanguinea* at Nethy Bridge a few days later. They have been identified by Isaac B. Ericson, who has now the British Museum Collection of this group in his possession to overhaul. He writes in the *Entomologisk Tidskrift* for 1908, pp. 121-126, in a short paper on Swedish *Trichopterygidae* that it is distinct from *fasicularis*, Herbst, although Ganglbauer (p. 327) gives *intermedia*, Gillm., as a synonym. He also points out that the type occurs in southern Europe, but that the more north you go a subspecies is formed, which he has called *thomsoni*.

He gives the following species of *Trichopteryx* as occurring in Sweden:—*grandicollis*, Mann., *montandoni*, Allib., *nigricornis*, Motsch., *picicornis*, Mann., *thoracica*, Waltl., *atomaria*, De Geer, *intermedia*, Gillm., v. *thomsoni*, I.B.E., *lata*, Motsch., *fasicularis*, Herbst, *cantiana*, Matth., *suffocata*, Halid., *breripennis*, Erichs., *longicornis*, Mann., *kirbyi*, Matth., *breris*, Motsch., *sericans*, Heer, *dispar*, Matth., and *cherrolati*, Allib.

Plebeius argus var. cretaceus, n. var., P. argus var. masseyi, n. var., P. argus var. corsica, Bell., and Plebeius argyrogynomon var. corsica, n. var.

By J. W. TUTT, F.E.S.

We are now engaged on a revision of *Plebeius argus* (*aegon*), a species that has for 150 years worried entomologists owing to its superficial similarity to *P. argyrogynomon* (*argus*), and the remarkable variation that it undergoes in its extended range from Sligo in the west to Japan in the east, and from Lapland in the north to the Mediterranean littoral in the south. Almost all authors who have handled the species appear to have fallen into some error or other, and in Staudinger and Rebel's *Catalog*, 3rd ed., 1901, one still finds some strange results.

The species is of interest to British lepidopterists, because we have, in the British Isles, at least three very marked races: (1) The smaller,

darker, wider-margined (δ), heath form; (2) The larger, brighter, narrow-margined (δ), chalk-down form; (3) The peculiar bright-tinted, blue-suffused female, moorland form. We distinguished the two first-named in our *British Butterflies*, 1906, and the second of these has since been referred to the Spanish race *hypochiona*, Ramb., but we think quite erroneously. We have a form just like it from Scandinavia, and think it might even be fairly argued that it was the form described by Linné, but for the present, and to prevent ourselves being accidentally forestalled, we name it var. *cretaceus*.

The third form above, the moorland form, was largely on our authority referred (*Ent. Rec.*, vii., p. 128) to the var. *corsica*, Bellier. This conclusion was based on a δ and φ received from Mr. W. E. Nicholson of Lewes, as var. *corsica*, the two forms agreeing fairly well on the upperside, especially in the φ , but it is, we have since discovered, on the underside that Bellier de la Chavignerie found the chief character of the Corsican form, and, in this, our "moorland" form disagrees entirely. This form, like our "down" form, therefore, appears to require a distinctive cognomen, and we shall deal with it in our revision of the species as var. *masseyi*, as we are indebted entirely to Mr. Massey for our examples of the species, from which our studies have been made, and we owe him some apologies for misleading him, in our ignorance, into applying the name *corsica*, to our insect, on the first introduction of the race to the notice of British lepidopterists.

One other detail may be noted. Throughout Europe and Asia, one of the most marked superficial differences between *Plebeius argus* (*aegon*) and *P. argyrogynomon* (*argus*) is found on the greater width of the marginal border of the upperside of all four wings in the δ . It was not, we believe, until two years ago, when Mr. Powell visited Corsica, and collected there for some time, that it became generally known that *Plebeius argyrogynomon* was also to be found there. At any rate, it was not till then that specimens of the latter species came into our possession. The insects were most puzzling, for, quite characteristic of *P. argyrogynomon* on the underside, and differing on this side most markedly from *P. argus* var. *corsica*, the upperside of the *P. argyrogynomon* δ presents a wide marginal border that strongly suggests that of normal *P. argus* (*aegon*), whilst the δ 's of the latter from Corsica, almost without marginal border, suggest normal *P. argyrogynomon*. An examination of the very different δ genitalia, by Dr. Chapman, proved that the underside indication was correct, and that we had not only a very special race, var. *corsica*, Bellier, of *P. argus*, but an equally peculiar race var. *corsica*, n. var., of *P. argyrogynomon*.

We hope to have the difficulties of the variation of *P. argus* fully cleared up in the next two or three numbers of our *Nat. Hist. of British Butterflies*, in which the original descriptions of all the forms will be published for students' own reference, but the facts of this advance note appear to be of sufficient general interest to all British lepidopterists, to lead us to publish it.

**A Coleopteron new to science—*Anaspis hudsoni*, nov. spec.
(with plate).**

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

Elongate, somewhat boat-shaped, being broadest in middle, black, clothed with very fine, sparse, yellow pubescence. Antennæ with first four joints yellow, the rest black, joints one to six longer than broad, one and two short, of about equal length, three about equal in length to one and two together, four a little shorter than three, broadest at apex, five triangular, broadest at apex, six rounded on inner side, broadest at apex, seven to ten rounded, moniliform, last joint elongate, longer than broad. Palpi fuscous-yellow. Head large, black, with a thin yellow streak at clypeus, rounded in front, straight, or almost straight behind, with acute posterior angles. Prothorax narrowed in front, a little broader (at base) than long, bisinuate at base, posterior angles somewhat acute, equally strongly transversely strigose all over. Elytra elongate, broadest about middle, as strongly transversely strigose as the prothorax, black beneath; legs slender, black, knees at apex of tibiae and spurs fuscous-yellow. Anterior tarsi feebly dilated, first joint short, as long as broad, second long and dilated, broadest at apex, broader than any of the other joints, third short, rounded, and bilobed. Intermediate tibiae slightly sinnate within. ♂ with third ventral segment of abdomen longer than the other segments, furnished in middle at apex with two long laciniae or appendages, which reach to the middle of the 5th segment, approximate at base, separated in middle, and convergent and truncate at apex, with a slight depression between them at apex. Fifth segment long and pointed, contracted a little beyond middle to apex, giving the appearance of a 6th segment,* with a small pit or depression which lies in the centre of the apical third of the segment, the lips of which appear to be slightly raised. Length $3\frac{1}{2}$ mm. Described from a ♂ specimen taken by me in the centre of a woody fungus on Scots' fir at Nethy Bridge, Invernessshire, on September 16th, 1908, and recorded by me in error as *A. septentrionalis*, Champ., *Eut. Mo. May.*, 1908.

This species appears to belong to the subgenus *Nassipa*, Emery (although the sixth joint of the antennæ is certainly longer than broad in my specimen), in which joints six to ten of the antennæ are rounded and moniliform. In *Die Käfer Europa's*, xxxv., 1898, Schilsky gives a table of all the Mordellids in which both *Anaspis garneysi*, Fowler, and *A. septentrionalis*, Champion, are included. I have looked up the description of all the species of *Anaspis* to date, and there is nothing which agrees with my specimen. As the appendages in the males (or the want of them in some species), and the structure of the ventral segments are very important and interesting characters, my friend, Mr. Hereward Dollman, has made beautiful drawings for me of these parts in all our British species, which will enable anyone to identify their specimens of this sex at once. I have compared my insect with specimens of all our species including *A. septentrionalis* which Mr. Champion left at the Museum for me to see. I must thank Mr. C. O.

* The genus *Pentaria* has six segments to the abdomen, but the penultimate joint of the anterior tarsi is bilobed; in *Anaspis*, the third joint is bilobed, and the penultimate quite small, and there are only five segments to the abdomen.

Waterhouse for his kindness in comparing them with me, and in reading through my description.

I have called this species *hudsoni* in honour of my friend and colleague, T. Hudson-Beare, with whom I was staying, and who was with me at the time the insect was captured.

EXPLANATION OF PLATE III.

1.	Male appendages of <i>Anaspis hudsoni</i> , Donisthorpe.
2.	<i>Anaspis frontalis</i> , L.
3.	<i>Anaspis septentrionalis</i> , Champion.
4.	<i>Anaspis garneyi</i> , Fowler.
5.	<i>Anaspis rufulabris</i> , Gyll.
6.	<i>Anaspis pulicaria</i> , Costa.
7.	<i>Anaspis melanostoma</i> , Costa.
8.	<i>Anaspis geoffroyi</i> , Müll.
9.	<i>Anaspis rufulicollis</i> , F.
10.	<i>Anaspis costae</i> , Emery.
11.	<i>Anaspis subtestacea</i> , Steph.
12.	<i>Anaspis maculata</i> , Fourc.
13.	<i>Anaspis latipalpis</i> , Schul.

Notes on *Nomiades melanops*.

By H. POWELL, F.E.S..

This is a strictly single-brooded blue, flying in April and May. The larva occurs on flowers of *Dorycnium suffruticosum* at Hyères in May and early June, and is very regularly attended by very active, medium-sized, black ants. The larva must, however, feed on some other plant than *Dorycnium* in Algeria, for there is none of it where I have taken the species. The pupa is pale in colour, attached to stones, etc. The attachment is weak, and, in captivity, pupae are sometimes found loose in the cage. It passes the summer and winter as a pupa. The species is generally found on limestone, but, at Hyères, it also occurs near the Cap Bregançon, on schistose soil. I found it there in abundance, April 19th, 1893.

It flies in April, in the Hyères district, also in May, but is generally worn in the latter month. Hyères localities are: Costebelle quarries, near Sanatorium, in the Vallée de Vertaubanne, Col de Serre, Carqueiranne, La Maunière, La Farlède, Cap Brégançon. The following are some actual dates and localities: April 19th, 1893, Cap Brégançon; May 1st, 1902, La Farlède; March 29th, 1903, Costebelle Quarries; April 20th, 1903, La Guiranne (Var); May 9th, 1906, La Maunière, along the paths and in clearings, few were fresh; June 3rd and 4th, 1906, La Turbie (Alpes-Maritimes) worn; bred April 12th, 1906, at Hyères; May 11th, 1907, at Sebdou (Oran), very worn; May 19th and 20th, 1907, Merchich near Sebdou (ten, specimens); May 25th, 1908, at Khencbela (Constantine) (1). The Algerian specimens are large, with undersides of a brownish-grey, and with rather small spots.

Larvæ were beaten from flowering *Dorycnium*, May 22nd, 1904, and June 1st, 1904 at Hyères, and June 13th, 1906 at Laghet, Alpes-Maritimes. Ants were beaten out with the larvæ every time, and were kept with them afterwards.

I made the following notes on the larva: June 1st, in the Vertaubanne Valley, I beat out of *Dorycnium suffruticosum* a couple of larvæ of *N. melanops*, one attended by a rather large ant which left it only

for very short intervals, returning quickly, and continuing to feel it over with its antennæ. The larva was semi-transparent by June 4th, and preparing for pupation. It had not fed for three days, yet the ant still kept to it. After pupation the ant remained with the pupa for several days, continually feeling it over with its antennæ. I could see no glands on the pupa, but had not time to make a very thorough examination. In the cage with the two *N. melanops*, I had also a larva of *Callophrys rubi*, and another of *Thesstor ballus*. The *melanops* ant sometimes examined the *ballus* larva, and caressed it with its antennæ, never staying long with it, however, but it would have nothing to do with the *C. rubi* larva.

Larva of N. melanops (nearly fullfed) described June 14th, 1908.—Length 10mm. at rest; breadth at widest part 3mm. The head is very small, black, and shiny. It is generally out of sight, hidden beneath the projecting prothoracic segment. The shape of the larva is typically Lycaenid—rounded stern, in continuation of the projecting lateral border; the dorsal centre is flattened, but each segment from the 2nd thoracic to 6th abdominal inclusive, is raised as a small mound on each side of the dorsal line; incisions deeply marked; abdominal segments 7 and 8 are slightly bombé. The general colour is pale greenish-grey in this particular specimen, but I have seen some greener, though never a bright green. The dorsal line, and all other markings begin on the mesothoracic segment. The dorsal (central) line is dark grey, widest on the thorax, faint and narrow after the 6th abdominal. A white line borders it, and runs along the "mounds." This line dies out on the 6th abdominal. There is then a second grey line rather darker than the ground colour. There is another faint line between it and the flange which is white. Between the white "mound" line and the second grey line, are oblique streaks running up, one on each segment, except prothoracic and 7th and 8th abdominals. Ventral surface grey, green centrally. I made no description of the pupa, merely noting it as whitish, with black dots.

Pupation took place early in June, and emergence in April of the following year. The shell of the pupa is thin and transparent, though strong. The colour of the wings is seen very distinctly for a day or two before the butterfly makes its appearance.

A Midsummer's Collecting at La Granja.

By (Rev.) F. E. LOWE, M.A., F.E.S.

(Concluded from p. 37).

The Melanargiids, when they came out, were very abundant, *Melanargia lachesis* swarmed everywhere. *M. syllius* in its restricted locality was common for two or three days, June 23rd-25th; *M. cleanthe*, though never a rival to *M. lachesis*, was well distributed. There are two very distinct forms of the female, one rare, coloured on underside like males, the other more common, and much more handsome, the underside of the hindwings being yellow, and the central and sub-terminal bands being filled with cinnamon-brown. Of *M. lachesis* var. ♀ *cataleuca*, we took only seven in all, very fine specimens. Among the Satyrids, *Satyrus circe* was abundant after July 7th, as a little later was a fine form of *Hipparchia alcyone*. *Coenonympha iphioides* we did not meet with in the lower swamps during the first fortnight, though we

were all on the look out for it, and took *M. aurinia* there; but on June 29th (unfortunately after Jones had left) I went up the mountains some 500ft. to 800ft., and, in a small morass, caused by a little stream spreading and percolating through the peaty ground, I came across my first specimens; I got seven that day. After this I returned to the swamps below, and found it was present in fair numbers, both sexes. Of the Lycaenids *Laeosopis roboris* was our special objective. Mrs. Lowe took the first, a male, and a worn female outside the walls of the Royal Garden on July 3rd. The next day we got fourteen specimens near the ash-trees by the farm under the hills some two miles off, as described by Mr. Sheldon (*Ent. Record*, xviii., p. 59). After this, males were abundant, though females up to the time of leaving were very scarce. *L. roboris* was particularly fond of a wiry-stemmed plant with fluffy, clover-like heads of flowers, and an aromatic scent, which covers the ground in large clumps. They were not often seen round ash-trees, which were trees, but commonly about stunted ash-bushes which appeared to have their young shoots constantly eaten down by the herds of black cattle which roam the hill-sides and plain. This ash is very unlike our familiar English species. It has a much darker, narrower leaf, which feels thicker in texture between the fingers. Around, and on, and within these bushes, I have frequently seen half-a-dozen to a bush, apparently searching for mates. It is a very easy insect to capture, though generally flying at a considerable height if disturbed. I ruined several much-wanted females in a fruitless endeavour to get ova. The Ruralids of the list were numerous among the oak shrub which clothes the foot of the hills, except *Nordmannia acaciae*, of which I only got two large examples. *Klugia spini* ab. *lynceus* was remarkably fine, and not rare. Flying with the usual form were some very small *Nordmannia ilicis* of the var. *aesculi*, quite dwarfs (I have the same from Eclépens). It seems difficult to believe that this is really *N. ilicis*. *Heodes viryanreae* var. *meigii* made its first appearance on July 1st, females on 14th. Of the latter I only got four, but one is a beauty, though small; a central band is formed across the forewings by the elongation and coalescence of the usual black spots, and the whole of the hindwings is suffused with black from the base to the marginal border. This species was like *Argynnis adippe* and *Dryas paphia*, evidently late this year, and not fully out before we left. *Rumicia phlaeas* was very common in one locality, and fairly distributed elsewhere. It was a dark form, but not extremely so. Probably the next brood would have proved more interesting. *Loweia gordius* (Is this certainly only a variety of *alciphron*?) was smaller and less heavily marked than the Martigny and Varzo specimens, and the females were nearly always of a much lighter colour than those of Switzerland, and never suffused on the hindwings as in ab. *intermedia*, Stefanelli, from the Italian Simplon. Both sexes were as a rule rather small, but not without exception. *Lampides boeticus* fairly common, and gave evidence that it would be much commoner—very variable in size—but none equal to the largest taken in Guernsey. *Plebeius aegon* was inferior to Guéthary specimens but very abundant. *Aricia astrache* was magnificent in size and colour. Of the "Skippers," the most interesting was *Powellia sao*, plentiful in its ordinary form, and there were less commonly gigantic specimens very richly coloured on the underside. I watched a pair of

these giants "flirting," but was prevented from capturing them by an overhanging branch under which they were gambolling. I was very anxious to obtain this large form thus associated, for it seems possible that we may one day make two species of what now we class as one.

Among the *Heterocera* I had much more limited opportunities of observation, but a few things taken may be deserving of a passing notice. I am indebted to Mr. Prout for identifying the Geometrids which I could not name, a large percentage of the few captured. The position of the hotel or my bed-room was unfavourable, and the light abominable, so that I was much less fortunate than usual in obtaining specimens at night. During our last week *Catocala conversa* became excessively common everywhere during the day. The first I saw thrilled me with excitement as something entirely new in my experience. It seems to be a species of no consistent habits. At first I thought that it rested only on tree-trunks, and soon I found that it was equally fond of rocks. Sometimes in passing I disturbed half-a-dozen from the surface of one small boulder. Next I found that it was often to be disturbed among herbage at the foot of a tree, as *Tryphaena pronuba* with us, and, finally, I saw that it not infrequently was to be seen hovering over flowers after the manner of *Plusia gamma*. A larva found fullgrown, and brought back to Guernsey, produced only *Orthosia litura*. Another, a Geometrid, of which I hoped great things, as if enjoying the joke, emerged as *Ortholitha peribolata*, a species which we are rather proud of possessing as a Guernsey native. Early in June small whitethorn bushes, and rather less frequently blackthorn, were almost entirely denuded of their leaves by larvæ of *Aylaope infusa*. On a coarse species of *Genista* with hairy seed-pods, I took many Zygænid-looking larvæ which spun up and proved to be *Heterogynis paradox*, but probably, from want of attention in the matter of food, pupated too early, and from which only females emerged. I found three smaller, bright pink cocoons of a similar character, spun up among the wiry stems of the plant which attracted *L. roboris*. These successfully emerged as *H. pennella* ♂s. A larva of *Calocampa evoleta* fed greedily, and pupated, but has not emerged. Chief among the moths to attract attention in the field was *Furranthis pennigerraria*, which dashed wildly about everywhere. Of *Fidonia famula*, I took four. The beautiful little *Heliothea discoidaria* was common on the rough lower ground in the middle of June, and was soon followed by swarms of the most brilliantly-marked *Lythria purpuraria* or *L. sanguinaria*? Another remarkably abundant and much varied species was *Campogramma bilineata*, some of whose forms were wonderfully banded, and presented striking contrasts of colour. *Rhodostrophia calabraria* was in large numbers, and quite the most vivid in colour I have ever seen. The two greatest rarities, teste Mr. Prout, which came into my hands, were two females of the excessively local *Perconia boeticaria* var. *castiliaria*; these were taken under alder bushes by the banks of a stream, and *Acidalia beckeraria*, where captured I do not remember. *Odezia atrata* was, of course, very plentiful and large, but as I had not then had the opportunity of reading Dr. Chapman's paper, I am not prepared to say that it was var. *pyrenaica*. *Crambus craterellus* was in extraordinary numbers up to 400 feet above La Granja. Of the Anthrocerids I saw but few. One *Anthrocera lonicerae*, one small five-spot, which looks like

A. meliloti, but that it has too broad a marginal band to hindwings. *A. sarpedon* just coming out as I left; about ten examples and one var. *trimaculata*, Esp. *Aglaope infausta* also began to show up at the end of my visit. I give a complete list of the moths I brought home, but feel sure that I took no heed of many more which are common everywhere, though many of those included must have been captured for other reasons than their rarity. Among the butterflies, I was greatly puzzled to know whether things were first, second, or third broods. The Spanish collector living on the spot might get to understand them. But to me there appeared to be a continuous succession of emergences of nearly everything.

The following is a list of all insects taken and identified:—*Papilio podalirius* var. *feisthamelii*, frequent; *P. machaon*, rare and ordinary; *Thaïs rymna* var. *medesicaste*; *Aporia crataegi*; *Pieris brassicae*; *P. rapae*; *P. napi* var. *napaeeae*; *Pontia daplidice*; *Anthocharis belia* var. *ansonia*; *Euehloë cardamines* (one, Jones); *Colias edusa* var. *helice*; *C. hyale*, very scarce; *Gonopteryx rhamni*; *Limenitis camilla*, two or three only; *Pyrameis atalanta*; *P. cardui*; *Vanessa io*; *Aglais urticae*, large and brilliant, but typical in markings; *Eugonia polychloros*; *Euvanessa antiopa*, hibernated imagines and larvæ; *Polygonia c-album*, early brood worn to rags; *Melitaea aurinia* var. *iberica*, nearly over June 21st; *M. desfontainii* (*boetica*), Jones took a pair same date; *M. cinxia*; *M. didyma* var. *occidentalis*, very local, and not abundant; *M. deione*; *M. athalia* (Jones); *M. parthenie*; *Laeosopis roboris*; *Ulugia spini* and var. *lyncestis*, common; *Nordmannia ilicis* and vars. *cerri* and *aesculi*, very abundant, partial to acacia trees, is it possible that it even lays its eggs on these? *Nordmannia acaciae*, rare; *Callophrys rubi*; *Bithys quercus*; *Heodes virgaureae* var. *miegii*; *Lowelia alciphron* var. *gordius*; *Rumicia phlaeas*; *Plebeius aegon*; *Scolitantides baton* var. *panoptes*, two; *Aricia astrache*, and trans. to var. *allons*; *Polyommatus icarus* var. *celina*, very scarce, about six in all, the only form of *icarus* seen; *Cupido minimus*, very small; *Cyaniris semiargus*, large and common, heavily-spotted undersides; *Lampides boeticus*; *Clastrena argiolus*; *Adopaea lineola*; *A. flava*; *Urbicola comma*, one on the last day; *Augiades sylvanus*; *Erynnis alceae*; *E. althaea*; *Powelli sao*; *Hesperia carthami*; *H. malrae*; *H. alvens*; *Nisoniades tages*, one worn; *Brenthis hecate*, nearly over by June 29th; *B. daphne*; *Issoria lathonia*; *Argynnis aglaja*, undersides with the green conspicuously bright; *A. niobe* var. *eris*; *A. adippe* and vars. *chlorodippe* and *cleodippe*; *Dryas paphia* var. *immaculata*, three males only; *D. pandora* and ab. *pauperula*, very numerous; *Melanargia lachesis*, the commonest butterfly, ab. *catalenca*, scarce; *M. iapygia* var. *cleanthe*, fairly common; *M. syllius*, had been abundant, but apparently local; *Erebia erias*, three in the mountains, and one very worn in the park close to the town; *Satyrus circe*, abundant; *Hipparchia aleyone*, ditto; *H. semele*, common and fine, but not var. *aristaens*; *Pararge egeria*, type, not common during our stay, probably we were between broods; *P. megaera*; *P. maera* and var. *adrasta*, common; *Epinephele jurtina*, most females var. *hispulla*, the males generally exceptionally dark; *E. lycaon*, common from July 12th; *E. tithonus*, just coming out July 14th, males only; *Coenonympha iphioides*; *C. arcana*, common, large and very broad, black borders; *C. pamphilus*, very small and ordinary; *Aphantopus hyperanthus*. **HETEROCHERA**: *Hemaris tityus* (broad-bordered); *Catocala conversa*:

Agrotis orbona : *Orthosia litura* : *Acidalia macilentaria* : *A. ochrata* ; *A. beckeraria* : *A. decorata* : *A. contiguria* : *A. rubiginata* (Jones) ; *A. emutaria* (Jones) ; *A. sericeata* ; *Perconia boeticaria* var. *castiliaria* ; *Rhodostrophia calabria* and ab. *striata* ♀ : *R. ribicaria*, two ♂'s, "interesting variation in position of lines on wings" (Prout) ; *Odezia atrata* : *Lythria sanguinaria* ; *Sterrhia sacraria* ; *Euchloris smaragdaria* ; *Anaitis praeformata* ; *Venilia maculuria* : *Anthometra plumularia* (Jones) ; *Eurranthis pennigeraria* ; *Fidonia famula* ; *Ortholitha peribolata* : *Camptogramma bilineata* : *Bapta trimaculata* ; *B. bimaculata* ; *Heliothea discoidaria* ; *Anthrocera lonicerae* ; *A. meliloti*? ; *A. sarpedon* and var. *trimaculata*, Esp. ; *Agloape infasta* ; *Heterogynis pennella* : *H. paradoxa* ; *Crambus pratellus* : *C. craterellus* : *C. pasinellus* : *Megasis ripertella* : *Myelophila cribrella*.

Notes on the early stages and habits of *Pieris manni*, Mayer
(with plate).

By H. POWELL, F.E.S.

(Concluded from p. 40).

LARVA.—*First instar*.—Just after hatching the larva of *P. manni* measures about 1.8mm. in length. At the end of the instar barely 4mm. The head is black and shiny, rounded, slightly flattened in front; lobe division well marked. The head setæ colourless, bent forward and downwards. The body is thin in proportion to the length. Skin shiny, thin and delicate-looking, semitransparent, pale-yellowish, and studded with minute black spots on dorsal and lateral areas. After feeding has commenced a greenish-grey tint appears, the green contents of the alimentary canal being visible. The ventral surface remains yellowish. Segments and subsegments well marked. Each tubercle bears a colourless hair, apparently terminating in a small knob. The exact form of this swelling is rather difficult to distinguish with the aid of a hand lens alone. Towards the end of the stage a faint yellowish dorsal line is visible, merely an indication of the yellow line which develops later.

Second instar.—Length at the end of this instar 5.75mm. Body rather less slender in proportion to length. Head rounded, lobe division well marked, shiny, black on top and on the sides, yellowish-green around the mouth-parts, greenish with a black suffusion around the ocelli and on the facial triangle. The head hairs seem to be more numerous than in the preceding stage. Colour of body more decidedly green than before, but the feet, the ventral surface, and the last few segments remain yellowish. Dorsal line more strongly marked, but still faint. The numerous brownish-black points on the dorsal and lateral surfaces give a slightly grey appearance to the larva when seen with the naked eye. The anterior edge of the prothorax is furnished with a fringe of stiff brownish hairs, bent forwards. The hairs arising from the tubercles on the body are rather stiff-looking, short, but of unequal length, and more numerous than in the first stage.

Third instar.—Length at the end of this stage 9.6mm. Head, immediately after the moult, of an uniform pale green. On drying the black suffusion reappears, but is less extensive than before. The head continues shiny. The tops of the lobes are black still, but less intense black; in some specimens it is more of a dark grey. Around the ocelli the colour is greenish, the facial triangle is greenish with a

roundish suffused black spot in the centre. The lower part of the head is dull green. The skin bristles with small, blackish, piliferous points. Body green with yellow dorsal line. The yellow lateral (spiracular) line is now apparent. The underside of the thoracic segment is green, as well as the bases of the true feet. Ventral surface yellowish. The head and body are furnished with short, rather stiff hairs, of a greyish colour, arising from the small black projections. These are of unequal size, and all the larger ones bear one hair. The hairs are of different lengths.

Fourth instar.—The length at the end of this stage is from 14mm. to 15mm. Head rounded, lobes on a slightly higher level than the facial triangle, and separated from it by a shiny narrow, Δ -shaped furrow continuing the lobe division. The head is now green, plentifully sprinkled with small black projections like those on the body, bearing each a greyish-white hair, rather stiff-looking. In some specimens, but rarely, the lobes are somewhat suffused with black. Body green. Central dorsal line canary-yellow, sharply defined, broader than in *P. rapae*. The only other line is the spiracular, of the same colour as the dorsal line. It is not a continuous line, being broken at the incision of each segment, leaving a wide space. The spiracles are rounded ovals, situated on the third subdivision of each abdominal segment, and in the centre of the yellow line. The dorsal and lateral surfaces bristle with small black projections, each one bearing a short hair (length of hairs unequal). Beneath the flange are fewer of these black points. There are some on the bases of the prolegs, but not on the ventral surface.

Fifth instar.—Length when full-grown 23mm. to 25mm. The head, except in size, is as it was in the previous stage, green, lobes slightly suffused with smoky-grey. The body is greenish-blue above, rather deeper towards the dorsal line. Ventral surface light green. Legs light green. Central dorsal line broad, narrower on thorax, canary-yellow. Spiracular line broad and of the same, or even brighter, colour; it is divided into a series of elongated spots by fairly wide spaces, one at each segmental incision. Spiracles are on this line, near the centre of each yellow spot on the abdominal segments; they are oval, brownish-white, with a shiny, black, raised border, and a vertical slit in the centre, which appears closed. The tubercles, or raised hair-bases, which are abundant excepting on the ventral surface, are nearly all black on the head and thoracic segments, with greyish-white hairs. The exceptions to this rule are certain rather small tubercles, occupying the positions of the primary tubercles on the 2nd and 3rd thoracic segments. These are black-tipped with dirty brownish-white bases, and the hairs they bear are black. Some of the primary tubercles are wholly black, but they can be recognised by the black hair which each one bears. The more numerous secondary (?) black tubercles are of various sizes; many are considerably larger than the primary tubercles, others being mere specks on the skin. Nearly all bear hairs of various lengths, some being extremely short. There is never more than one hair to each tubercle. The larger tubercles are in a rough line running down the centre of each sub-segment. They appear rather deeply embedded in the skin, their dark colour being visible beneath the surface. On the abdominal segments the primary tubercles are small, dull white, tipped with

black, and with a single black hair. The much larger shiny black tubercles have a light-coloured or colourless hair each. As in the case of the thoracic segments there are numerous very small black points on the skin. Each black tubercle, small or large, rests on a black, suffused stain, seemingly beneath the skin. The very small tubercles have a correspondingly small base stain. The yellow lines are free from the very large tubercles. The skin is covered with a minute network of "lemon-rind" cells, giving it a granular appearance when magnified (40). The hairs from the black tubercles have often a very small "knob" at the free extremity. The eversible chin-glands noticed by Mr. Harrison (*Ent. Record*, vol. xx., p. 253) are often visible when the larva is walking and when it is irritated.

PUPATION.—When getting ready to pupate, the larva of *P. manni* spins a carpet of silk, makes a pad of silk to which it attaches itself by its anal pair of claspers, and spins a thin cord of silk, composed of many strands. This is fixed on either side of the larva to the stone or rock on which it is resting, and passes over the first subdivision of the 2nd abdominal segment, pressing closely to the skin, and holding the larva fairly closely to the rock. The attachments are, in the case of a larva which has spun up in horizontal position, opposite the incision between the 3rd and 4th abdominal segments, and the silk cord leans forward to the point where it crosses the larva. When the larva spins up vertically, it sinks back to some extent, the centre or anterior portion of the 3rd segment coming opposite the attachments, the forward incline of the cord being in consequence less accentuated. On the day after spinning up, the larva will have contracted to some extent, so that, in both cases, the incline of the silk cord will then be less. After spinning up, certain modifications take place in the shape of the larva. There is a shrinking in length, and a swelling of the segments. The thoracic segments are raised and distended dorsally by the thoracic ridge of the pupa, which is evidently developing beneath the larval skin. The mesothoracic segment is particularly affected, as the highest point of the ridge is beneath it. The head is pushed forward and downwards. The 1st abdominal segment appears narrowed and reduced. In reality I suppose the reason for this is that it has not swollen out in proportion to the others. On the day following pupation the colour of the larva, already dulled, has changed to a pale purplish-blue above, the yellow lines remaining, though faded. A specimen under observation pupated about 28 hours after spinning up, but the time taken depends to a great extent upon the temperature. Some are much longer about it. When the skin is being cast the abdomen is arched. The skin splits down the back of the thorax, and shrinks off backwards aided by the efforts of the larva. It passes under the silk cord and collects in a heap at the posterior extremity of the pupa. The cremaster is then slipped out of, and over, the mass of skin, and hooks on to the silk pad. The abdomen, strongly arched, is then worked round and round so that the hooks of the cremaster may get a good grip of the pad, and this movement is continued until the shrivelled skin, which has passed under the last segments, falls. The angles of the pupa are blunt and the front of thorax and head-parts are flattened anteriorly and blunted to begin with. They assume their normal shapes in about an hour.

PUPA.—As in the case of many other Pierids, the pupa of *P. manni*

has two colour-forms. Three larvæ bred in August produced light green pupæ, which soon gave the perfect insect, but all the larvæ which pupated in October and November changed to light grey pupæ, destined to pass two or three months at least in this state. Description of the grey form of pupa:—Total length from 16.5mm. to 19mm. The following measurements are of a pupa 18.6mm. in total length. Length of snout 1.5mm.; from apex of wing-case to end of cremaster 6.5mm.; depth of thorax from highest point of thoracic ridge 5mm.; depth of wing-case from highest point of lateral ridge 4.5mm.; length of cremaster .65mm. Colour: When freshly changed it is watery-green, purplish down the back. The yellow lines of the larva now run along the dorsal and lateral ridges of the pupa. On the day following the change the purplish colour of the dorsum has become grey, the watery-green is restricted to the wing-cases, and the ridge lines have paled to a yellowish-grey. Finally the pupa becomes pale grey, *very* slightly darker on the thorax and wing-cases. The yellow dorsal line is very pale. It starts at the end of the snout as a pale yellow spot, is continued over the thoracic crest, is very much effaced on 1st and 2nd abdominal segments where the ridge is low, becoming clearer again on the following segments along the ridge, where it is interrupted by a black spot at the beginning of each segment. The thoracic ridge has also several black spots or patches, the highest part of the crest having two, generally running together to form one elongated spot. A small projection, tipped with black, rises above the base of each antenna-case. The snout, bluntly pointed, has a roughened, though shiny, surface above, wrinkled beneath, is pale grey, tipped with very pale yellow, sprinkled with small black specks on the sides. All the appendage-cases are deeply wrinkled (viewed under microscope $\times 50$ approx.), the maxilla-, leg-, and antenna-cases transversely, wing-cases irregularly. There are square spots at regular intervals along the antenna-cases. These are sometimes black, but often very pale. Antenna-cases reach a little beyond the apices of wing-cases, the maxillæ going further still, projecting well over the 5th abdominal segment. Their ends, which lie pressed together, are tipped with brown or black. Eye with roughened pitted surface, most of the pits spotted black. Glazed eye, greenish. Thorax irregularly wrinkled, and sprinkled with small brown pits. The abdominal segments are similarly pitted; pits brownish on dorsum, not specially coloured beneath. On dorsal ridge there is, at the front of each abdominal segment, just before the black patch, a whitish, waxy-looking lump, more prominent in some specimens than in others. (This white, waxy lump is much better developed in *Pieris brassicae*, rather less so in *P. rapae*.) Apart from the darkened pits, there is a number of larger black spots on the surface of the pupa. These are, along the nervures of the wings small, on the thorax few, but numerous and larger on the abdominal segments. They occur all round the 7th and 8th abdominal segments, but do not extend as far as the ventral centre on the 5th and 6th abdominals, though they are of large size on these segments. The ventral centre of these two segments is marked with two long patches of black. The lateral ridge is not very high on abdominal segments. It reaches its maximum in two black-tipped points on the 2nd and 3rd abdominals over the wing-cases and then ends. Over the wing-cases the ridge is slightly hollowed and leans out a very

little. The dorsal ridge ends where the cremaster begins. The cremaster, seen from above, is shaped much like a duck's beak, hollowed out down the centre in the shape of an inverted V. Surface shiny, but pitted. Colour, pale grey. The extremity is furnished with a number of light brown, shiny hooks, shaped like a T, or more still, like an anchor upside down. *P. brassicae* and *P. rapae* have similar hooks. The spiracles are elongated ovals, with a very light brown or yellowish central slit. They are just below the lateral ridge. The pupa, when examined under a low power ($\times 40$), has a shiny, rather waxy, appearance, though much pitted, and in some parts wrinkled. The general colour is a very pale grey, slightly greenish on the appendage-cases, less so on the wing-cases. In spotting, shape, and colouring it is considerably like *P. brassicae* on a small scale, resembling this species more than it does *P. rapae*.

DIFFERENTIAL POINTS IN LARVÆ AND PUPÆ OF *P. manni* AND *P. rapae*.—The following are the main points of difference between *P. manni* and *P. rapae* in the larval and pupal states. [I may have missed some differences in the early stages of the larvæ, for I had no microscope with me at the beginning of my observations.] I could see very little difference in the EGGS. That of *P. rapae* is a very little shorter and proportionately stouter, measuring 1.3mm. \times .5mm. *P. manni* 1.45mm. \times .5mm. The hand lens showed no difference of structure, colour or appearance in general. The LARVA of *P. manni* has a head more or less black for the first three instars, the first stage head being almost entirely black. *P. rapae* has a pale yellow head to begin with, becoming yellowish-green subsequently, and not quite green until the 4th stage has been reached. It is never black. The body is also paler in young *P. rapae*, which is no doubt partly owing to the fact that the black points or tubercles are on a smaller scale. It is of a pale green in the 3rd stage, and the dorsal and spiracular lines are, as yet, barely visible, and are of a whitish-green, not yet distinctly yellow, whereas, in *manni*, the dorsal line is already distinguishable towards the end of the 1st instar, being more strongly marked with yellow in the 2nd instar, and showing distinctly, as is also the spiracular line in the 3rd instar. The two species are probably more alike in the 4th stage than in any other. *P. manni* has now a green head and the body colour is much of the same green as in *P. rapae*, but, by the greater width of its dorsal and spiracular lines, and the greater size of the black points sprinkled over the body and head giving the larva a coarser and darker appearance, it is still quite easy to recognise *P. manni*. The same differences exist in the 5th stage and are even more accentuated, so that there is never any difficulty in separating the larvæ. *P. rapae* is of a tender green colour; *P. manni* bluish above and on sides, green beneath. (The autumn larvæ seem to be bluer than those of the summer broods.) Dorsal line nearly twice as wide in *manni* as in *rapae*. The lateral (spiracular) line is also much wider and the spaces, separating the spots of which it is composed, are not so wide. The larva has a rougher, coarser look than that of *P. rapae* owing to the large size of many of the black tubercles and the coarser hair they bear. *P. rapae* appears soft and downy in comparison with *manni*. When preparing to pupate, *manni* develops a tinge of purple on dorsum and sides, which I have not noticed in

rapae. *P. rapae* attains on an average a greater size than *P. manni*. The following distinctions were observed with microscope:—

Pieris rapae (5th instar): Primary tubercles white with a jet-black hair, and of about the same size as the largest black points. These points are shiny black, each terminating in a light (whitish) hair. There are, besides, numerous very small black points, many of which bear a short whitish hair. The black points have not a suffused black patch at the base. Spiracles oval, nearly white, with a raised, shiny, black border.

Pieris manni (5th instar): Primary tubercles white, tipped with black, on abdominal segments, much suffused with black on thoracic segments. They are smaller than in *rapae*. Each one carries a black hair. The large black points are *much larger than the primary tubercles*. They have light grey, or nearly colourless, hairs, coarser than those of *rapae*. Each one has a diffused black stain around the base, more particularly on abdominal segments. The small black points are also larger than in *rapae*, and have often dark base stains. Spiracles oval, light brown, with a raised, shiny black border. The white primary tubercles are very conspicuous in *rapae* under microscope, but not easy to see in *manni* owing to the smaller size and much larger area of black at tip. In both species the hairs appear often to terminate in a very small knob.

The PUPA is smaller in *manni*, 16.5mm. minimum to 19mm. maximum total length. I have pupæ of *P. rapae* ranging from 16mm. to 21mm. Average about 19mm. Shape of *P. manni* less angular than that of *P. rapae*. The thoracic crest is more rounded, not rising to such a high sharp point. The pointed projections of the lateral ridge on 2nd and 3rd abdominal segments are lower and less thorn-like. Abdominal ridge similar in shape and development. Nosehorn shorter and entirely pale grey excepting a very faint dusting of black specks on the sides. *P. rapae* has a very definite black streak along each side of nosehorn, which I have never seen in *manni*. The absence of this streak enables one to identify a pupa of *manni* at a glance. The pupa (grey form) is pale grey in *manni*, the grey having a slight greenish tint on appendage-cases. In colour and spotting it is much like a diminutive *P. brassicae* pupa, as before stated. *P. rapae* pupa is of a pale brownish-grey, quite distinct in colour from *P. manni*. The arrangement of the black spots is similar in both species, but in *rapae* they are often smaller, and, as a rule, many are missing. The microscopical black specks connected with the skin-pitting are frequently denser about the thorax and wing-cases in *rapae* than in *manni*, sometimes showing as a suffused mottling. I do not wish to convey by this statement that there are, in this case, more skin-pits than usual, but merely that the spots staining them are larger and darker than in general. The light green summer form of the pupa is common to both species. As with the grey winter form, the shape makes it easy to separate them, while the presence or absence of the black streak on the nosehorn is always a good distinction. A small number of *P. rapae* and *P. manni* larvæ reared in August all gave light green pupæ, but no doubt the grey form also occurs in summer, under certain conditions. The green form apparently is not met with in autumn, but I have one specimen of *P. rapae* of an intermediate form. Collectors who have series of *P. rapae* from France would do well to examine

them closely. They may very probably find *P. manni* amongst the commoner species.

NOTES ON COLLECTING, Etc.

LEPIDOPTEROLOGICAL NOTES FROM WEST CORNWALL.—About three years ago I commenced the formation of another collection of lepidoptera after a good many years cessation from the pursuit. I find, however, that insects are not, on the whole, plentiful here, although some very desirable species are met with. On May 30th, 1906, I saw a specimen of *Phryxus livornica* flying at a row of broad beans, then in full bloom, in my garden. Hurrying into the house I seized a net and speedily secured it. The next evening I caught another at the flowers, besides missing a third specimen. On the following June 6th, I saw, but failed to take, a fourth specimen. In 1907 and 1908 I did not see a specimen, although I grew extra quantities of broad beans to act as a lure. I believe, however, that a number of immigrants of this species must have landed here on May 30th, 1906, for, on that eventful afternoon a swarm of *Pyrameis cardui* suddenly appeared, flying from the direction of the sea two or three miles away; so abundant were they that every hawthorn bush had at least half-a-dozen feeding on its blossoms. *P. cardui* was accompanied by *Pyrameis atalanta*, although the latter species was scarce in comparison. The same evening *Plusia gamma* suddenly appeared in plenty. That *P. cardui* crosses regularly from the opposite coast of France I am firmly convinced, as *P. cardui* is found here every year generally in abundance, even in the year 1901 I frequently saw it. In 1894 I saw a swarm of *P. cardui* that had just landed on the shores of Mounts Bay. Stragglers were then flying in, but the immigrants were mostly resting in an exhausted state upon the grass-stems. I picked up scores without the slightest difficulty. On September 15th, 1908, I took a very fine specimen of *Leucania vitellina*, at sugar, upon an apple-tree in my garden, I sugared every evening, until the end of October, and also assiduously searched the ivy flowers, but did not catch another. On October 10th, 1908, I took a male specimen of *Campogramma flaviata*, at sugar in my garden, and, on October 16th, a female of the same species at ivy bloom. Unfortunately, I had forgotten to take some chip boxes with me that evening, so could not retain her for breeding purposes.—A. J. SPILLER, Godolphin Cross, Helston. February 8th, 1909.

CURRENT NOTES.

We have seen a copy of Mr. G. H. Verrall's latest volume of "British Flies," which can be obtained from Messrs. Gurney & Jackson, 10, Paternoster Row, E.C., the price being 31s. 6d. net. This volume deals with some of the largest and most handsome species of British Diptera, viz., the *Stratiomyidae*, *Leptidae*, *Tabanidae*, *Cyrtidae*, *Bombyliidae*, *Thereridae*, *Scenopinidae* and *Asilidae*, and extends to 780 pages with 407 figures in the text by J. E. Collin, F.E.S. A list of the Palaearctic species is given at the end of the volume, with separate pagination extending to 34 pages, in which an attempt is made to arrange the species in systematic order. This list can be purchased separately, price 1s. net.

The arrangement of the families is a modification of that suggested by Osten-Sacken and almost identical with that of Aldrich is his "Catalogue of the N. American Diptera," and we note that the author has included the fauna of the world in his Table of Families, while the Palaearctic Fauna is dealt with in his Tables of the Genera, this fact, in conjunction with the Systematic List of Palaearctic species already referred to, should make the work one of considerable value to students outside the British Isles. All the British species are described with extreme minuteness of detail, probably with the intention of remedying the defect mentioned in the Preface that the "common and more ancient species have as a rule been very inadequately described," while many valuable notes are given concerning this Palaearctic species and their synonymy. A large figure of some typical species is given at the commencement of each family, and, in most cases, of each subfamily, while the numerous detail figures in the body of the work materially add to its value.

We are glad to notice that some attention has been paid to that most useful aid to systematic work, the study of the life-histories, in a chapter by Dr. D. Sharp, profusely illustrated, dealing with the metamorphoses of the families included in this and the previous volume, though one cannot help being struck with the fragmentary state of the knowledge on this subject when the numbers of species, their comparatively large size, and their abundance in certain localities, are taken into consideration.

We congratulate the author and artist upon the production of a volume which must rank as one of the best published on this Order of Insects, and which adds materially to the sum of our knowledge of the families dealt with.

Those lepidopterists specially interested in Palaearctic butterflies should be careful not to miss a most interesting paper on the variation of certain Moroccan butterflies and Anthrocerids, by Professor Charles Blachier (*Ann. Soc. Ent. Fr.*, lxxviii., pp. 709 *et seq.*). He claims specific rank for the beautiful *Heodes phoebus*, hitherto considered a race of *H. thersamon*, and figures a most beautiful aberration of *Rumicia phlaeas* under the name of ab. *oberthueri*. All interested in this species should look at the figure of this specimen. We must congratulate Mr. Culot on his excellent work throughout pl. iv. The colour-printing, too, of this plate is especially good. In the *Bull. de la Soc. Ent. France*, p. 319, Professor Dupont also describes a colour-form of *Thesstor ballus*. Also in the *Ann. Soc. Ent. France*, lxxvii., pp. 496 *et seq.*, Dr. Chapman has a short paper on some Larentiid Geometrids captured in the Pyrenean district, and illustrates his remarks thereon by figures of the ancillary appendages of *Entephria caeruleata*, *E. cyanata*, *E. floricinctata*, *E. infidaria*, *E. nobiliaria*, *E. caesiata*, *E. polata*, and *E. tophaceata*.

Our esteemed colleague, Mr. Henri Gadeau de Kerville, made, in 1906, a zoological expedition into Khroumirie, a mountainous but fertile district in north-west Tunis, abutting on Eastern Algeria. Since his return he has written up an account of his journey, whilst the collections made have been handed over to specialists, and their reports have been combined with his own account of the journey in a first class illustrated volume entitled, *Voyage Zoologique en Khroumirie* (published by J. B. Ballière et Fils, Paris). The zoological

memoirs are by the Comte Carl Attems (Myriopoda), Don Ignacio Bolivar (Orthoptera), Dr. Raphael Blanchard (Hirudina), and Mr. Louis Germain (Mollusca). Besides these there are records of the Crustaceans, Arachnida, Insecta (of other orders than Orthoptera), and Vertebrates, met with. A map of the district should help to make the journey easy to some of our students of Palaearctic lepidoptera, a group of insects totally ignored by Mr. de Kerville. The illustrations are in every way excellent.

“Insect Stories,” by Professor Vernon L. Kellogg (G. Bell & Sons), is a most charming volume, written with excellent skill and knowledge, and comprising many interesting episodes of insect life. The wonderful way in which *Amnophila* stores up the paralysed bodies of lepidopterous larvæ for the future grub; the importation of *Vedalia* to combat the ravages of *Icerya* in the orange-trees; the result of a fight between *Eurypelma*, the giant tarantula of California, and a *Pepsis* wasp; the habits of the ant-lion larva, and many other delightful insect stories, as accurate and true as they are well-written, makes this one of the most delightful gift books that an older naturalist could give to a younger one after he had pleasurable read it himself (A.O.).

The annual presidential address to the members of the Société Entomologique de Belgique, delivered by the Baron G. de Crombrugge de Piequendaele, contains a very interesting resumé of the modern system of the classification of the *Alucitides*. It is by far the most farsighted pronouncement on the subject that has yet appeared on the continent, and, in his sympathetic appreciation of the work done in vol. v. of *A Natural History of British Lepidoptera*, he shows a clearer grip of the details necessarily involved in the classification of the “plumes” on biological grounds than any continental entomologist appears yet to have done. His own contributions to the life-histories of certain species are most interesting and important.

Mr. E. A. Butler adds *Cymus obligans*, Horv., to the list of British hemiptera, the species occurring commonly in the Hastings district in damp places on *Solanum dulcamara*.

Dr. Wood is still adding new species of *Phora* to the British list, and to science. His latest additions are *Phora crassipes* (Stoke Wood, August, 1906), *P. armata* (Stoke, August), *P. nudis* (Stoke Wood, July to October), *P. afñnis* (Middle Park Pool, Yackhill Marsh, etc., July to September), *P. ciliata*, Zett., and *P. aequalis* (widely distributed and very common), *P. flarescens* (Haugh Wood, May-August; Coldborough Park, October), *P. longiseta* (widely distributed in Herefordshire, May-August), *P. riralis* (banks of river Monnow, July 31st, 1908), *P. surdifrons* (Stoke Wood, August, 1906), *P. parra* (woods near Tarrington, May-June; sent also from Scotland by Malloch), *P. mallochi* (Bonhill, April and September), *P. glabriifrons* [Bonhill, April-May (? hybernated) and autumn], *P. propinqua* (Tarrington, Tram Inn, May-June and autumn), *P. minor* (Shobdon Marsh, July 18th, 1906; Middle Park Pool, September 1st, 1906), *P. uliginosa* (Shobdon Marsh, etc., July to October), *P. flara* (common and widely distributed, summer and autumn), *P. collini* (woods near Tarrington, May-June, September-October).

A very interesting discussion of the early stages of the *Ægeriids* or clearwing moths, took place at the meeting of the South London Entomological Society on February 11th. The interest chiefly lay in the

fact that the sum total of actual knowledge of more than two dozen British lepidopterists, certainly including three or four of the best-informed field-lepidopterists in the country, amounted to so little that it really seemed amazing that, of actual simple details, such as, where the egg of each British species is naturally laid, what the newly-hatched larvæ are like, where the newly-hatched larvæ and larvæ in the early instars feed, and how these habits differ from those of the later instars, practically nothing was known of even such common species as *Egeria tipuliformis*, *E. cynipiformis*, *E. myopiformis*, *E. ichneumoniformis*, *E. culiciformis*, or even the much-bred *E. chrysidiiformis*, and *E. musciformis*. Of course, something was known of *Trochilium bembeciforme*, in the egg and later larval (and pupal) stages, and even of most of those named above in the late larval and pupal stages, but of the early life-histories in nature, most of the members present expressed profound ignorance.

The value of a really good collection of British insects was well-illustrated by the sale of the first part of the "Maddison" collection at Stevens' sale rooms, on February 23rd and 24th. To outsiders, some of the prices will seem remarkable, and even to those who know something of the value of good British insects, the prices will prove interesting. Aberrations of *Gonepteryx rhamni*, £6 10s., £2 15s., £1 15s.; of *Dryas paphia*, £8; *Argynnis aglaia*, £9 10s.; *Brenthis euphrosyne* £9; *Melitaea athalia*, £9; *Euanessa antiope*, £7; *Engoumia polychloros*, £7 10s.; *Aglais urticae*, £3 5s., £4 10s., £1 5s., £1 1s. each; *Vanessa io*, £2; *Pyrameis atalanta*, £2 and £5 each; *Apatura iris*, £7 and £8 each; *Limenitis sibylla*, £1 15s., £1 1s., £1 1s. each; £2, £1 12s. 6d. for two; *Epinephele tithonus* £8 10s., and £2 each; *Epinephele ianira*, £6, £2 2s. each; *Chrysophanus dispar*, £5, £5, £2 5s., £4 15s., £3 15., £2 15s., £4 5s., £1 5s., £3 5s. each for males, £4 5s., £4 5s., £5 10s., £2 15s., £4 5s., £3 10s. each for females; *Rumicia phlaeas* £1 10s., £2 2s., £2, etc.; *Agriades corydon*, £1 15s., £1 10s., £1, £1 10s. per pair; *Polyommatus icarus*, gynandromorphs, £2., £1 15s., £1 7s. 6d., £1, £1 10s. each; an underside aberration, £2; another, £1 12s. 6d.; *Cyaniris semiargus*, £1, £1 10s., £1 8s., £1 10s., and 10s. per pair; *Plebeius aeyon*, four gynandromorphs, £3 5s.; *Celastrina argiolus* ab. *subtusradiata*, £1 12s. 6d. The whole of the butterflies produced just about £360, a record, one supposes, for a collection of British butterflies alone.

The price brought by the *Aretia caia* in Mr. Maddison's collection are worth noting—Lot 385 (16 specimens), 5s.; lot 386 (9), 5s.; lot 387 (3), 5s.; lot 388 (2), 6s.; lot 389 (3), 3s.; lots 390 and 391 (15), 10s.; lot 392 (1), £1 15s.; lot 393 (1), 16s.; lot 394 (1), £1 1s.; lot 395 (1), 15s.; lot 396 (9), 7s.; lot 397 (11), 10s.; lot 398 (8), 18s.; lot 399 (1), £5 10s.; lot 400 (1), £3 15s.; lot 401 (1), 10s. 6d.; lot 402 (3), 12s.; lot 403 (3), 10s.; lot 404 (3), 14s.; lot 405 (1), £2 15s.; lot 406 (3), 10s.; lot 407 (3), 12s.; lot 408 (12), 10s.; lot 409 (12), 10s.; lot 410 (5), 11s.; lot 411 (5), 17s.; lot 412 (7), 6s.; lot 413 (1), £2 2s.; lot 414 (1), £1 13.; lot 415 (2), 12s.; lot 417 (2), 22s.; lot 418 (1), £6; lot 419 (1), £1; lot 420 (1), 12s.; lot 421 (12), 10s.; lot 422 (6), 9s.; lot 423 (5), 6s.; lot 424 (1), £2 2s.; lot 425 (1), £3 10s.; lot 426 (2), £1 1s. Of these, the most remarkable, and possibly valuable, specimen scientifically, was one in lot 410 (with five wings) from Gregson's collection, and figured by Mosley, the lot going, as noted above, for 11s. The series produced £64 0s. 6d.

The series of *Arctia villica* in the same collection also produced good prices—Lot 426 (2), £1 1s.; lots 427-8 (12), 16s.; lot 429 (5), 6s.; lot 430 (1), £4 15s.; lot 431 (4), 5s.; lot 432 (4), 7s.; lot 433 (2), £3; lot 434 (6), 7s.; lots 435, 436 (6), 7s.; lot 437 (1), £2 5s.; lot 438 (1), £1 12s. 6d.; lot 439 (1), £1 1s.; lot 440 (1), £3 5s.; lot 441 (3), 10s.; or £19 17s. 6d. altogether.

SOCIETIES.

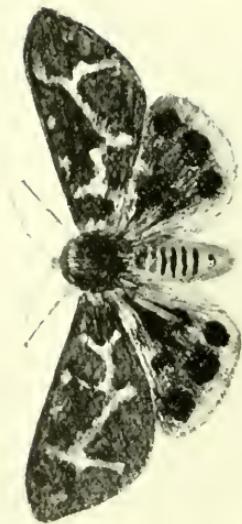
CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*February 2nd, 1909.*—EXHIBITS: *Cœnobia rufa*—A series from various localities including *abs. LINEOLA*, *PALLESCENS*, and *FUSCA*, and photograph (by Mr. Main) of the ♀ anal processes used to deposit the ova in the central pith of rushes, Mr. H. M. Edelsten. *Noctua glareosa*, taken at sugar in Richmond Park, September, 1907; also specimens from Sandown, Aberdeen, and the Shetlands, the specimens from the latter locality being very dark, except one intermediate between the dark and light forms, Mr. W. J. Kaye. *Phlogophora meticulosa*, taken freshly-emerged on December 11th, at Rickmansworth, Mr. H. Leach. *DIANTHŒCIA CONSPERSA*, bred from Bude larvæ, Mr. L. A. E. Sabine. *TEPHROSIA BIUNDULARIA*,^{*} three broods reared in 1906. Three pupæ of the third brood “went over” to 1907, and the resulting imagines differed in appearance from the bulk of the brood, having the lines on the wings more continuous and more clearly defined, being, in fact, more like the first (spring) brood, Mr. A. J. Wilsden. *February 16th.* The exhibits were practically confined to *Pseudoterpnæ cytisaria*, which was the subject of the paper appointed to be read on this occasion by the Rev. C. R. N. Burrows.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 11th, 1909.*—*ÆGERIA ANDRENIFORMIS.*—Mr. Newman exhibited portions of the stems of *Viburnum*, and pointed out the evidences showing that the larvæ of *Ægeria andreniformis* were present. They were found in a shady locality. *LEPIDOPTEROUS OVA.*—Mr. Tonge stereographs of the ova of *Tiliacea citrago* in situ on lime twigs of *Ruralis betulae* on sloe. *REARING MELAMPIAS EPIPHRON.*—Mr. Main, a second-brood specimen of *Melampias epiphron*, bred on September 20th, 1908; also *ABERRATIONS*: a very light example of *Stauropus fagi* from the New Forest, and a very dark form from Epping Forest. *ABERRATION OF BRENTHIS SELENE.*—Dr. Hodgson, a dark smoky specimen of *Brentthis selene* from East Sussex, with rayed submarginal markings. *AUTUMNAL BROOD OF CAMPTOGRAMMA FLUVIATA.*—Mr. R. Adkin, a series of *Camptogramma fluviorum* bred from November 21st to December 13th, 1908, from Eastbourne. *MONGRELISATION OF FORMS OF APLECTA NEBULOSA.*—Mr. Harrison reported that the results of the cross-breeding of the forms of *Aplecta nebulosa* by Mr. Mansbridge, were *grey* \times *thompsoni* = all *robsoni*, and *robsoni* \times *grey* = 50% of each of these forms.

* Surely these were *Tephrosia bistortata (crepuscularia)*, and not *T. crepuscularia (biundularia)*. It is well-known that the former is partially triple-brooded, whilst a second-brood example of the latter is an amazing rarity. Yet one cannot suppose that if these were *T. bistortata*, they would have passed a critical assembly such as the City of London Entomological Society, as *T. biundularia*. The only known records of the second-brood examples of the latter species (in each case single specimens only) are discussed *Ent. Rec.*, ix., pp. 55-56.—ED.

Vol. XXL

PL. V.



In l. H. S. Clark.

ARCTIA CIMA AB. CLARKI, N. AB.

The Entomologist's Record, etc., 1909.

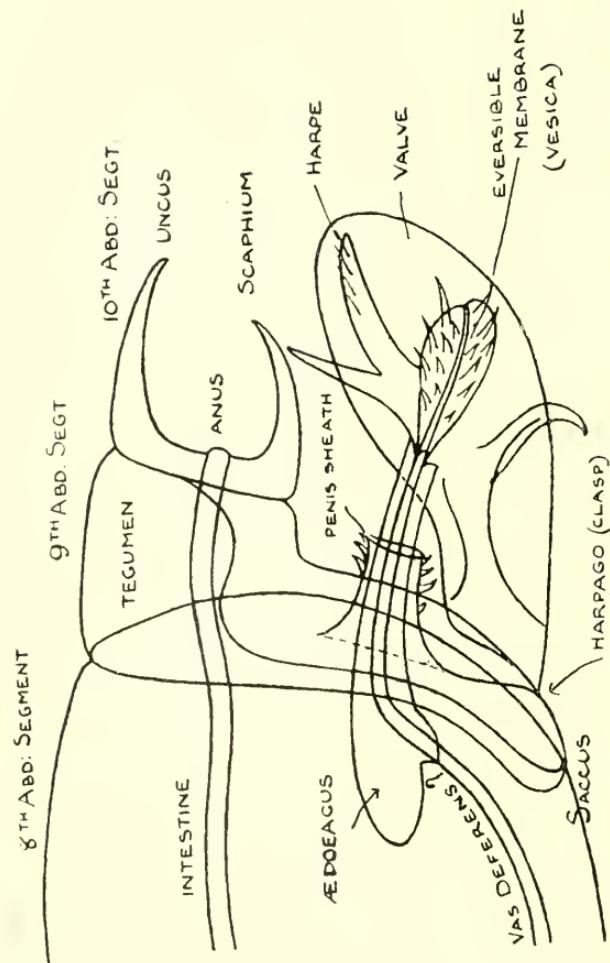
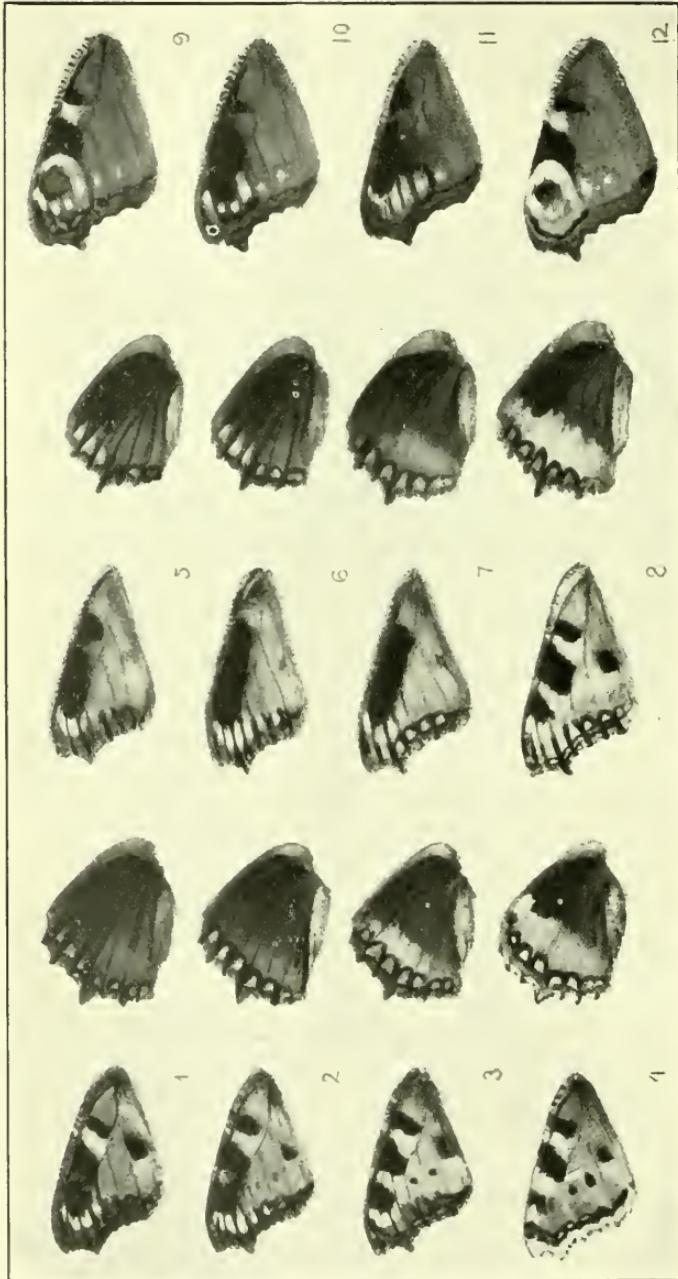


DIAGRAM OF MALE GENITALIA FROM LEFT SIDE—WITH LEFT HARPAGO (CLASP) REMOVED (LEPIDOPTERA).

The Entomologist's Record, etc., 1909.

Pl. T. A. Chapman.



Det. T. Reuss.

AN "ICOLOR" AND "IOFORM" ABERRATION OF *VANESSA URTICEA*.

Fig. 1. *V. URTICEA* ab. *ICOLORIS*, ♂. Fig. 2. *V. URTICEA* ab., ♂. Fig. 3. *V. URTICEA* ab. ♂. Fig. 4. *V. URTICEA* ab. *GRISSEOMARGINATA*, ♀. Fig. 5. *V. URTICEA* ab. *IOPROTIFORMIS*, ♀. Fig. 6. *V. URTICEA* ab., ♀. Fig. 7. *V. URTICEA* ab., ♂. Fig. 8. *V. URTICEA* ab., *FASCIATA*, ♂. Fig. 9. *V. IO* ab. *TRANS. FISCHERI*, ♀. Fig. 10. *V. IO* ab., ♂. Fig. 11. *V. IO* ab., ♂. Fig. 12. *V. IO* ab., ♀.

Collecting in Switzerland in 1908.

By ROSA E. PAGE, B.A.

Having spent a most delightful month in 1907, collecting on the Simplon Pass, in the Val d'Hérens and the Val d'Illiez, we decided, in the summer of 1908, to taste the entomological delights of the Vallée de Chamonix and the Nicolaithal.

Going straight out to Martigny, we arrived on July 24th, much too tired by our long journey to do anything but idle; but on the 25th (a glorious day), sallied forth for the famous walk under the cliffs on the road to Vernayaz, expecting to find swarms of good things. In this we were greatly disappointed, as the season was an early one, and we were, therefore, about a fortnight too late. *Leptidia sinapis* required considerable selection, but, by dint of continued application, a short series was obtained. *Hipparchia alcyone* and *Satyrus cordula* were plentiful, but going over; scarcely a specimen was worth retention. Other insects occurred as follows:—*Iphiclides podalirius* (♀), a few *Melitaea didyma*, a single *M. phoebe*, two very worn *Nordmannia iliris*, two *Parnassius apollo*, one *Eugonia polychloros*, one fresh *Polygonia c-album*, three *Gonepteryx rhamni*, two *Colias edusa*, and worn *Polyommatus damon*: *Pieris rapae*, *Epinephele jurtina*, and *Dryas paphia* were plentiful and in good condition, while *Melanargia galatea* and *Agriades corydon* were worn. One or two specimens of very worn *Lowria alciphron* var. *gordius* were observed. We also took a few fresh *Cyaniris semiargus*, and were delighted to see the pretty little *Lowria dorilis* for the first time.

Somewhat disappointed, we walked over to Branson in the afternoon. *En route* we saw no insects at all, and, on the noted *Collateda* ground and along the banks of the Rhone, there was very little about. As is well known, a very high wind, accompanied by much dust, often springs up at Martigny in the afternoon, making it almost impossible to use the net, and the walk back to Martigny extremely disagreeable. *Enodia hyperanthus* was fairly common, but going over; one very tattered *Apatnra iris* was seen, but not captured. Practically, the only insects taken were a few very fresh *Everes aletas* (summer brood) and two very fresh *Pontia daplidice*.

On the 26th, we visited the cliff walk again, but with similarly disappointing results. We missed a fine *Euranessa antiopa*, but captured *Aporia crataegi* and *Hipparchia semele*. In the afternoon we climbed through the vineyard path to the Tour de la Batiaz, on *Melitaea herisalensis* intent, but, although we had a very interesting view of the Rhone Valley, we did nothing entomologically. Nothing was about but *Pieris rapae* and *Epinephele jurtina*, a very worn *Papilio machaon* and a few Anthrocerids.

By this time, we had come to the conclusion that we were wasting time at Martigny, which is not a place that anyone, who was not entomologically inclined, would choose to stay at, as, besides the terrific afternoon winds, the dust and the innumerable mosquitoes, the place is not well drained; so, on the 27th, we walked up to the Col de la Forclaz, on the old diligence route to Chamonix, having been attracted thither by Mr. W. G. Sheldon's note, in the *Entomologist's Record*, vol. xvi., pp. 98 *et seq.*, and having been, by his kindly help, posted up with information as to localities, etc. On the road which passes through

Martigny-Bourg, some very fine *Iphiclides podalirius* were taken; the capture of these at puddles on the road causing very great amusement to the natives. One or two *Leptidia sinapis* were seen on the road to the Col, with an occasional fresh *Colias edusa*, *C. hyale*, and *Gonepteryx rhamni*, *Hipparchia alcyone* were worn, while *Dryas paphia* and *H. semele* were in good condition. A few good *Polyommatus damon* were obtained, and above Les Rappes nice *Melitaea athalia*, one large *Vanessa io*, *Parnassius apollo*, a very few *Heodes virgaureae*, *Erebia aethiops*, *Pararge megaera* and an occasional *Agriades corydon*. The ubiquitous *Epinephele jurtina* and *Pieris rapae* were plentiful. Altogether, the walk, which was a very hot and rough one, was disappointing, as far as insects were concerned. The grass was almost all cut, and what was uncut looked very brown and dry. There were very few insects, even on the inviting-looking banks of thyme by the roadsides.

On the 28th, we tried the larch-covered slopes of the Arpille, which proved good ground. Insects were not plentiful anywhere, but seemed to be pretty generally distributed, especially in the more open places. At the base of the woody slopes very fresh *Melitaea athalia* and *Brenthis amathusia* kept coming to the flowers, while *Aporia crataegi* appeared, but too worn to be taken. As we ascended, the Erebias became more common, many flying round the larches. We took *Erebia ligea*, *E. goante*, *E. melampus*, *E. euryale*, and *E. manto*, all in very good condition. The meadows round the hotel, although the grass had not been cut, looked very brown, and produced nothing better than *E. tyndarus*. The whole of the 29th, being dull and rainy, gave a good opportunity to get forward with the setting. We had the pleasure of meeting Dr. Lang at dinner, and spent the remainder of the evening comparing notes with him. We were sorry to learn that he was passing on to Evolène next morning.

On the 30th, we worked on the beautiful path to the Glacier du Trient. *Brenthis amathusia*, *Melitaea dictyna*, and *M. athalia* were very fine, and plentiful on thyme and thistle heads; *Erebia goante*, *E. euryale*, *E. ligea* were also in good condition; *Melampias melampus* was in numbers; a few worn *Erebia ceto* were taken, as were also a very light form of *Heodes virgaureae*, and an occasional *Parnassius apollo*, *Gonepteryx rhamni*, and *Aporia crataegi*. *Pararge maera* was worn, and a few worn *Erebia manto* and one battered *Lycaena arion* var. *obscura* were observed; the latter on thyme. Two specimens of *Issoria lathonia* were seen, the only two, although we worked on this ground several times. The path is cut out of the mountain-side and is not much more than a yard wide; on one hand is a rushing torrent about as wide as the path, on the other, steep precipices, in places wooded, but in others quite open. The sensation at first is similar to that experienced in walking on a plank over a deep chasm, but the spot is a delightful one. We worked as far as the end of the glacier, but the moraine appeared to harbour very little life. With the exception of *Pieris rapae*, the only insects seen were *Cupido minimus*, *Polyommatus hylas*, *Coenonympha arcania* var. *darwiniana*, and *Adopaea glava* (*thaumas*). In the afternoon, we went out again over the same ground. Although the sun was shining on the path much more fiercely than in the morning, there appeared to be fewer insects, and, strangely enough, these were more difficult to net. *Melampias melan-*

pus were mostly resting on the path with wings closed vertically, thus becoming inconspicuous in the brilliant light; when struck at they instantly heeled over, thus eluding capture; other *Erebias* seemed to be on pairing intent.

On the 31st we took the bridle-path to the Col de Balme, the famous point of view for Mont Blanc. Dipping down to the valley of Trient, we found *Erebia stygne* and a few fair *E. manto* in some meadows, then, ascending by steep zigzags through the Forest of Magnin (where we took a few more *E. stygne*), we came to more open ground, covered with Alpine rhododendrons. Here we expected to find *Brenthis pales* and *Colias palaeno*, but were disappointed. Arriving at the summit of the Col, we found a high wind blowing, and saw no insects with the exception of two *Colias palaeno*, single examples of *Parnassius delius* (?), *Anthrocera exulans*, a few *Aglaia urticae*, and *Pieris rapae*. The absence of insects was probably due to the rhododendrons having practically finished flowering. A few gentians peeped out from the short grass, and in places there was a wealth of violas and forget-me-nots. But the view of the Mont Blanc range, with the glorious sun shining on the snow-covered peaks, is one never to be forgotten, and coming upon one suddenly just as one reaches the summit, after a weary upward grind of some hours, affects one indescribably. We sat here a time, unable to take our eyes from the fascinating panorama before us, then climbed higher still to the Croix de Fer to obtain a still finer view, and, led by the advice of a nimble goatherd, took a short cut down the steep mountain slopes, which we are not likely to forget, especially as it commenced to rain and the grass became somewhat slippery. However, not another insect appeared, and we reached the Col de la Forclaz, having had a most enjoyable day, but with a very poor bag.

August 1st, not looking very promising, we worked in the aftermath of some meadows near the hotel, and got a nice series of *Erebia tyndarus*. These were not numerous and were restricted to one spot in the meadow. They needed much looking over, but included a good proportion of females. On comparing them with those taken last year in the Laquinthal, I find the two spots near the apex of the fore-wing far better defined in the Forclaz specimens than in those from the Laquinthal. *Urbicola commu* was evidently just coming on, and a very few *Vanessa io* were taken.

August 2nd was fine and sunny, so we spent the morning on the glacier path. Besides the insects taken here previously, an occasional worn *Papilio muchaon* and *Parnassius apollo* were seen; one *Polyommatus damon*, *Aricia astrarche*, and a few *Ariadna corydon* were taken. On the 3rd we climbed to the summit of the Vanelot, no insects appearing until we arrived at the rhododendrons. There we took some very nice *Brenthis pales* and *Colias palaeno*, and a few *Issoria lathonia*, all very fresh, just above the châlet, in little dells below the ridge. The *C. palaeno* settled on juniper-bushes, and, when disturbed, flew very strongly up and over the ridge on to the Tête-Noire side of the mountain, while *B. pales* flew close to the ground, settling for a second or so on flowers of *Arnica montana* and *Hieracium aurantiacum*. By 3.30 p.m. the flight of these insects appeared to be over.

On Tuesday, the 4th, we ascended the Arpille, from the summit of

which the Rhone valley, with the St. Bernard route, appeared spread out before us like a map. The geological formation and the flora here were similar to those of the Vanelot. *Brenthis pales* were not in such good condition as those taken on Monday on the Vanelot, while, on the other hand, *Issoria lathonia* was just emerging. There were plenty of good *Erebia tyndarus*, but *Coenonympha satyron* was worn; one *Plebeius optile* and one fine *Pyrameis atlanta* were seen, the latter looking very strange to one who has always associated it with the plains. *Colias palaeno* were generally fresher than on the Vanelot, but gave one plenty of exercise. They were never in any numbers, but appeared one or two at a time and flew very fast. The distant Bernese Alps appeared remarkably distinct, betokening a break-up of the fine weather, which proved to be only too correct. On the 5th we left the Col de la Forclaz with regret, having had splendid weather most of the time and some very good collecting, although insects did not swarm as we believe they would in a more favourable year. At any rate, they compared very unfavourably with the number seen during the same period last year, in the Simplon Pass. We heard afterwards that the weather broke up on the day we left, and that the Col was wrapped in clouds for some days, the visitors shivering in the hotels with nothing to do. From which fate may the gods preserve us.

Walking on through the beautiful Tête-Noire Pass to Chatelard, we saw hardly an insect, with the exception of a few *Erebia ligea*. One perfect *Apatura iris* settled on the road so near to us that we could easily have taken it, had not the nets unfortunately been packed. From Chatelard we took train to Argentière, and were surprised to see the new railway-banks, which had been planted with a kind of white crucifer, alive with *Pieris rapae*.

The same afternoon we walked to Les Tines, on the road to Chamonix. On the left bank of the Arve, a large fresh *Pontia daplidice* ♀ was netted, but the sun disappearing at the same moment, and a storm coming suddenly up the valley, we hurried back to the hotel. The 6th, 7th, and 8th were cold and rainy. Although we were out each day, not even *Pieris rapae* was bold enough to venture from its hiding-places, and by the 9th we were beginning to feel a little bit desperate, so set out by train to Chamonix, thence to climb the Brévent. The weather proving better, we took a few *Pieris rapae*, *Heodes virgaureae* (passé), and very fair *Argynnис aglaia* in the great gully, a freshly-emerged *Polygonia c-album*, and an occasional *Erebia ligea* in the zigzags of the forest. On the open slopes near Plan-Achat, we found a few *Erebia mnestra*, and should have obtained a very nice series, but the sun vanished about 2 p.m., and the weather became dull and gloomy for the rest of the day. Other insects taken were very fair *Melampias melampus*, one *Erebia ceto*, good *E. tyndarus*, worn *Coenonympha arcania*, very fresh *Erebia goante*, and *Aglais urticae*. Near the houses of Les Monssoux, on a bank of flowers, were *Dryas paphia*, *Argynnис niobe*, *A. aglaia*, *Polyommatus icarus*, and *Parnassius apollo*. One beautiful *Euranessa antiopa* was seen careering wildly down the slope near Plan-Achat, but neither *Pontia callidice*, *Colias palaeno*, *Parnassius delius*, nor *Brenthis pales* were seen, although these have been previously recorded from the Brévent; probably we were too late.

On the 10th, the weather having improved, we sallied forth prepared

to make good the deficiencies of the last few days, especially on the look-out for more *Pontia daplidice*, of which, however, we saw no sign. On the slopes to the left of the River Arve, near Lavancher, there was no abundance of insects, but *Urbicola comma* was in fair numbers. An occasional worn *Enodia hyperanthus* ♀, worn *Heodes virgaureae*, *Argynnis aglaja*, and *Melampias melampus*, fresh *Agriades corydon* ♂, fair *Erebia manto*, a good *Coenonympha arcania*, and one very nice *Erebia ligea* were all the captures, although much ground was traversed. On the banks of the river, *Pieris rapae* and *P. brassicae* were abundant, mostly with their wings torn; *Parnassius apollo*, and an occasional *Aglais urticae*, were the only species seen.

The 11th was spent in ascending the Montanvert, crossing the Mer de Glace, and returning to Argentière by the Mauvais Pas, and proved a grand day—not entomologically, however. Very few insects were seen during the whole of the day, the most interesting of these being *Pyrameis atlanta* on the Montanvert.

On the 12th we went by train to Zermatt. The 13th was wet. On the 14th we walked to the Findelen Cascade and viaduct of the Gornergrat railway. In meadows on the way were *Heodes virgaureae*, an occasional very worn *Chrysophanus hippothoë*, *Parnassius apollo* ♂, two *Colias edusa* (one very fresh, the other in rags), two worn *C. hyale*, a very good *Issoria lathonia*, a few very nice *Agriades corydon*; *Pieris brassicae* were fairly common, *Argynnis aglaja* ♀s abundant, very much bleached, and very busy egg-depositing with *Coenonympha pamphilus* of very rich colouring, one *Polyommatus hylas* ♀, *Urbicola comma*, and fresh *Hesperia alveus*. In the afternoon, Mr. Page being very busy setting, I tried some ground on the right bank of the Visp, which produced *Erebia goante* in abundance, but almost all very worn, very good and abundant *Hesperia alveus*: fair *Epinephele lycœon*, fresh *Plebeius argus* (*argyrogномон*) and *P. optilete*, *Aricia astrarche* and *Agriades corydon*, in good condition, with *Argynnis aglaja*, and very fair *Brenthis euphrosyne*. I was very interested in taking this species in August, and at first rather sceptical as to its identity, but apparently this is not an uncommon experience in the Alps (see *Ent. Rec.*, xix., pp. 231 *et seq.*).

Next morning, the 15th, we tried the Zmutt Valley, where we had the good fortune to meet Dr. Chapman, who kindly gave us hints as to further collecting in this district. We found *Parnassius apollo* and *Epinephele lycœon* in good condition and plentiful, and, on a delightful little slope, carpeted with a purplish labiate flower, mingled with wild thyme and fairly alive with insects, took, among other things, some very nice *Heodes virgaureae* ♀ of the *zermattensis* form; the males, however, were worn. The other captures included *Colias phicomone*, *Powellia sao*, *Urbicola comma*, *Issoria lathonia*, *Melitaea parthenie* var. *varia*, *M. phoebe*, all worn; *Erebia goante*, *E. euryale*, *E. tyndarus* in good condition; *Plebeius argyrogномон* worn. The sun disappeared about 2 p.m., and rain set in for the rest of the day. On August 16th, signs were evident of the weather clearing up, so we climbed up the Trift Gorge, a delightful little place, where we found many flowers and plenty of insects, but these were mostly *passé*. A fresh brood of *Brenthis pales* occurred in one spot, and a specimen of *Parnassius delius* was captured by the little stream. *Erebia euryale*, *E. tyndarus*, and *Urbicola comma* in very good condition were the chief things taken.

In the afternoon, I tried again the steep grassy heights on the right bank of the Visp, finding a few small meadows still uncut. Many worn *Erebias* occurred, but nothing worth climbing after.

The 17th, giving promise of grand weather, we took our long-talked-of climb up the Gornergrat. Ascending through the wooded slopes, no insects were seen, the road being mostly in shade, and the grass covered with dew. At the summit itself, four *Pontia callidice* were seen, and vigorous attempts were made to net them, to the amusement of the crowd of tourists who stood closely packed on the very small spot of ground from which the best views are obtained of the Gorner glacier, and the mountains from which it and its tributary-glaciers originate. These *P. callidice*, however, persisted in flying over the precipitous edge, from which there was a clear drop of a couple of thousand feet to the glacier beneath. The enormous extent of glaciers and snow-covered peaks to be seen in all directions, with the green Nicolaithal and Zermatt, 5000 feet below us, formed an entrancing sight, which glued us for two hours to the Gornergrat (although we were icy-cold). However, we at last had to make a move, and, on the return journey, found *Brenthis pales* abundant and mostly in good condition the whole way down from the Gornergrat station to the Riffelalp Hotel. Nothing else was seen but a few *Erebia tyndarus*, one *Polyommatus orbitulus*, and one *P. pheretes*.

From the Riffelalp, instead of descending directly to Zermatt, we took the longer way home by the Findelen Valley and Glacier, a very beautiful walk; but the sun being by this time (middle afternoon) off the valley, nothing else was seen with the exception of *Colias hyale* near the Findelen Hotel.

On the 18th, I revisited the Zmutt Valley, the weather being fair for collecting. A few *Heodes virgaureae* var. *zermattensis*, some males of the same species, and a few very fine ♀ *Melitaea didyma* on patches of thyme by the side of the path (the males were worn); abundant fresh *Epinephele lycœon*, *Lycarna arion* var. *obscura* (♀) in fair condition, and one very worn *Nordmannia ilicis* were the chief captures. A very nice light form of *Pararge maera* was taken. The 19th was very dull and produced no insects.

On the 20th we ascended the Schwarzee; the sun was very brilliant, so much so that, in the afternoon, the streams all appeared very turbid and swollen, whereas in the morning they were clear and of normal size. At the beginning of the Zmutt Valley, a brood of *Agriades corydon* appeared to be emerging, and good *Colias edusa* were taken. The carpet of flowers previously noted had been taken possession of by a couple of cows: naturally, all the insects had fled. *Epinephele lycœon* were very worn, hardly any being worth taking; no more *Melitaea didyma* or *Heodes virgaureae* were seen, although *Parnassius apollo* was flying freely. We crossed the river by the upper bridge, but found nothing of any note until we came to the steep slopes just past Hermattje. Here we had some very good exercise, running up and down after *Colias phicomone*, which appeared plentiful and kept rising from the grass, often in pairs, always at a little distance up or down the steep slopes. These proved to be mostly worn specimens. I should say these slopes are very good ground for *C. phicomone*, a fortnight or so earlier in the season, as also for *Brenthis pales*, which was very abundant, but worn. *Issoria lathonia* seemed to be

just coming on, and some perfect specimens were netted. One very fresh *Pontia callidice* was taken just outside the Schwarze Hotel and a very small *Colias palaeno* in good condition, halfway up the mountain. Although we passed many likely spots, we saw only two *Parnassius delius*, neither of them being within range.

On the 21st, we came down the Nicolaithal by train, *en route* for England, our last entomological vision being a specimen of *Euranessa antiopa* flying just below Täsch, on ground which looked as if it would repay a visit in search of the larvae of that species.

An "iocolor" and "ioform" aberration of *Vanessa urticæ*, L.
(with plate).

By T. REUSS.

In July, 1906, my attention was drawn to the important results obtained from the temperature experiments of Professor Standfuss and Mr. Merrifield. Being interested in the biological problems concerned, I then first experimented on over 100 larvae of *V. urticæ* from two wild broods, and obtained 65 aberrations in the course of a month. These exhibited 39 of the aberrative features, singled out in two columns by Mr. Raynor (*anteā* Jan. no.), whilst some also exhibited what I term "ioformity," *viz.*, a transition of markings to *V. io*. My best "ioform" specimen, however, was bred on October 17th, as the result of an experiment made by exposing the pupa to the direct and intensified sun's rays and heat (48°C.), and it so strikingly blended the characteristics of the two species, *V. io* and *V. urticæ*, that I named it ab. *ioformis* (pl. vii., fig. 1). This specimen was exhibited on December 2nd, 1908, at a meeting of the Entom. Soc. of London. To describe and biologically explain the markings of this aberration it appears desirable to consider (1) the "palaeform" (fixed hereditary) details of the specimen; (2) its aberrative characters; (3) its "io-neoform" colours and markings, (progressive in the direction of *V. io*).

1. PALÆFORM (ESTABLISHED HEREDITARY) DETAILS.—The ground colour of the forewings, the first costal macula, and the inner marginal spot, with the adjoining yellow parts, are palaeform, but browned and enriched by stimulated vitality. The colours of the scales and hairs of body, legs, and basal parts of wings, are also as in the parent species.

2. ABERRATIVE DETAILS.—On the forewings the second and third costal maculae coalesce, the two median spots absent. The same partly protoform characteristics are shown in *V. urticæ* ab. *ichnusoides*, Sélys, and (in the costal markings) in *V. io* ab. *belisaria*, Obth. (pl. vii., fig. 10).

3. IO-(NEO-)FORM (PROGRESSIVE) DETAILS.—*Upperside forewing*: At the apex there is a semicircle of ocelliform, metallic, white spots, the lower two of which are shaded with violet by the marginal markings; the outer wing-fringes darkened; the shape of the apex that of *V. io* by enclosing a greater space and leaving the wings less pointed than in the normal *V. urticæ*. *Upperside hindwing*: Colour dark velvety-brown-red (*io*-colour), spread over the wing-surface much as in *V. io*, leaving the large area where the ocellus should form brown-black, with lighter parts behind the three violet (*io*-colour) marginal spots (developed in *V. io* into an ocellus). These violet markings show signs

of ocelliformity by the third spot being drawn up as a streak, and separated from the *urticae* chain of markings; the greyish-brown parts around them, though crossed by black along the veins, suggest the light grey ring round the ocellus in *V. io*. *Underside forewing*: The browned median area and the space between the 1st and 2nd costal blotches are further darkened by reddish-brown streaks and spots; the rest of the wing-surface brown-black; three "ioform" black dashes in the margin instead of lunules, and three of the ocelliform white spots of the upperside, marked by yellowish spots, as in *V. io*. *Underside hindwing*: Colour black-brown, with one broad darker band; no 8-mark near the base; the marginal markings partially disintegrate. *Opaqueness of the wings*: If held against the light the wings appear as dark and untransparent as those of *V. io*, and, also as in *V. io*, the ocelliform spots of the upperwings show as faint points of light. *Antennae*: Browned.

To explain this mixture of markings in a specimen bred from a normal *V. urticae* larva, I would suggest that a (relatively) fixed species, such as *V. urticae*, is the result of an established balance in a trinity composed of two inner principles, the one neoform or progressive (plasm-thought), the other palaeform or conservative (plasm-memory), and one external—the influence of climate. Now plasm-memory, primarily progressive in effect, but conservative in tendency, becomes *fixed* by repetition of detail under the continuous influence of regular climatic conditions.* Thus the more constant (fixed) in facies a species appears, the more perfect is the balance between progressive vitality on one side and fixed plasm-memory, *built* and *upheld* by regular climatic conditions on the other. Obviously, to effect any change in the facies of a "fixed" species, it is necessary to overthrow the established balance described. For this purpose the chief factor of the external principle, normal temperature, offers itself as easy to alter, and altered, *abnormal* temperature must, from the above, be capable of impairing (partially suppressing) fixed (palaeform) plasm-memory, in which case both the conservative factors opposed to progressive vitality would be upset and the barrier to change removed. In the *pupal stage* "arrested or retarded development" (Standfuss) seems to be the symptom of this suppression of "fixed" hereditism, as is pointed out by the fact that the imagines from pupæ of *V. urticae*, which I bred in + 20 to + 48° (50°) C., emerged as normal (somewhat thinly scaled) specimens in 4 days 15 hours, while the aberrations, which resulted from the *same treatment* began to appear after 7½ days (pl. vii., figs. 4, 8) and after 10 days (pl. vii., figs. 1-3, 5-7). The insolation of the pupæ of pl. vii., figs. 1, 2 and 8 produced no separate symptoms of this kind.

In the *imago stage* the broad floods of colour, which give to certain extreme forms the appearance of being painted in the young secessionistic style of human art (pl. vii., figs. 1, 5-7, 10, 11), may perhaps be explained by a sudden burst of action on the part of vitality according to the degree in which conservative plasm-memory was

* The annual cycle (changes) of the seasons, being regular, is fixing in influence. The two seasonal extremes sometimes even produce two correspondingly different sets of fixed plasm-memory. Witness, for example, the brown, spotted *V. (Araschnia) levana* and its black, white-banded summer form, *prorsa*.

upset; also these simplified markings *in part* strongly suggest proformity (atavism).

It is well known, that, because temperature mostly acts indirectly, very similar forms are obtained by frost—2° C. to—20° C. (Standfuss). In *urticæ* aberrations and in *io* ab. *belisaria*, Obth., bred by either frost or heat (pl. vii., figs. 10, 11), the wings are flooded with black (and blue-white); in *V. antiopa* ab. *hyggæa*, Hdrch. (frost or heat) with yellow; in *V. atalanta* ab. *klemensiewiczi*, Schille (frost or heat) very beautifully with red, blue and white. As protoform stages of development, beginning with one cell, are quickly recapitulated by every organism during development—passing from the simplest to more and more complicated forms (Haeckel), and as this applies to the whole, as also to the constituent parts (in this case to the markings and colours of the developing-wing in the pupa), it follows that “protoformity” will tend to appear and mix more or less with palæformity after a partial overthrow of the latter has taken place, because “protoform memory” is potentially inherent in the organism, and only needs to be carried on by active vitality. This vitality, defined by the tendency to (actively) seek, and the capability to (spontaneously) cause, new development in new forms directly the necessary favourable conditions are found or given, will, if only uninjured (and, perhaps, stimulated), not only use up the primitive and palæform plasm-memory left, but will also overbalance the same by a + in action, so that (grafted on protoformity and palæformity in a degree corresponding with that in which fixed plasm-memory was suppressed) progressive neoformity must infallibly result, and this neoformity will never be chaotic, but aim towards taking some definite shape. If this aim be *ocelliformity*, and if it be defined more clearly in the case of *V. urticae* by colour and other detail as *ioformity*, from the closely-related ocelliform species, *V. io*, the above illustration will be found to fit exactly the case of *V. urticae* ab. *ioformis*. According to the theory of Standfuss (*Handbuch d. Pal. Mac.-Lepidopt.*), *V. io* branched off from *V. urticae* under the continued influence of a raised temperature acting on a great number of generations, and, if this were so, it would seem that the “*ioform*” aim or tendency has always been potentially inherent in *V. urticae*, and is, indeed, still there (as proved by the ab. *ioformis*), ready to crystallise into form when the conditions are favourable. Naturally, in the youth of the species, soon after it had finished laying its vital foundations as a butterfly, and had then begun to develop embellishments in relation to light (colour) and temperature, plasm-memory was not so strongly fixed as to-day; at, therefore, that period, leaps, both in colour and markings, were probably relatively common [polymorphism; “form-throwing” (Boelsche)], thus offering “the material to be sorted by natural selection” (Standfuss), to be fully developed and to be fixed by repetition into separate, relatively constant, species.

V. urticae ab. *ioformis* thus appears as the result of a potentially inherent “*ioform*” tendency in *V. urticae*, brought into activity through a partial suppression of fixed (palæform) plasm-memory, by the abnormal influence of the sun’s rays and heat. As the *direct* cause for the action of the potential physiological factor is here again a physiological one, it becomes evident that ab. *ioformis* (or other aberrations of the category) *might* appear “spontaneously”

(without the action of an abnormal outward factor) by the, *in that case, pathological* failure of paleform plasm-memorv. That aberrations do so appear is perhaps proved by the (occasional) records of extreme forms, bred spontaneously, under normal conditions, among large numbers of normal specimens.

EXPLANATION OF PLATE VII.

Fig. 1. <i>Vanessa urticae</i> ab. <i>ioformis</i> , Rss., ♂.	Fig. 7. <i>Vanessa urticae</i> ab. ♂.
Fig. 2. <i>Vanessa urticae</i> ab. ♂.	Fig. 8. " " ab. <i>fasciata</i> , Rss., ♂.
Fig. 3. " " ab. ♂.	Fig. 9. <i>Vanessa io</i> ab. <i>trans. fischeri</i> , Stdffss., ♀.
Fig. 4. " " ab. <i>griseom- arginata</i> , Rynr., ♀.	Fig. 10. <i>Vanessa io</i> ab. <i>belisaria</i> , Obth., ♂.
Fig. 5. <i>Vanessa urticae</i> ab. <i>ioproto- formis</i> , Rss., ♀.	Fig. 11. <i>Vanessa io</i> ab. ♂.
Fig. 6. <i>Vanessa urticae</i> ab. ♀.	Fig. 12. " " ab. ♀.

Figs. 1-8 represent aberrations of *Vanessa urticae*, obtained by exposure of pupae to artificial heat (insolations) and presenting characters found perfectly developed in related species (e.g., an ocellus in figs. 1, 2, 3, 5, 6, as in *V. io*, see figs. 9, 10, 11 and 12; a conspicuous margin in fig. 4, as in *V. antiopa*: a band across the wing in fig. 8 as in *V. levana* ab. *prorsa*) Fig. 10 was bred by Standfuss after two "insolations" of half an hour each.

Notes on Microlepidoptera of Southwest London.

By ALFRED SICH, F.E.S.

On August 28th, 1907, I saw what at first I took for a small piece of straw lying crossways on a birch trunk in the garden at Chiswick. As I approached, the object took wing, and on capture proved to be a specimen of *Sitotroga cerealella*, Ol. This is not a common insect, and the date is, I think, much later than usual for its appearance, but those insects which are more or less connected with articles of commerce, as I presume this species is, are often somewhat irregular in their times of appearance.

While searching tree-trunks, on July 27th, 1907, on what was then the Chiswick Golf Links, I found several specimens of *Tinea cloacella*, Hw., resting on a trunk attacked by a fungoid growth. Among them I noticed a rather small, very dark specimen, which was taken. When preparing to set this the next morning, I was delighted to find that it was a specimen of *Tinea camprimulgella*, H.-S. Subsequent search revealed no further specimens.

I took one specimen of *Tinea nigripunctella*, Hw., off a wall of an out-house in Chiswick, on July 8th, 1900. This had much more the habit of an *Ornix* than of a *Tinea*. It sat up, so to speak, like an *Ornix*, and also twirled its antennae, as do members of that genus. On May 22nd, 1907, I was surprised to find an example of *Lithocletis heegeriella*, Zell., at rest on apple-bark (Chiswick); there was an oak-tree in close proximity, but I had never taken this species in the district previously. While mentioning this genus, it may be, perhaps, well to record the occurrence of some species grouped under the old, and now obsolete, name of "pomifoliella." Since Mr. E. R. Banks and Dr. Wood thoroughly investigated this group, the determination of the species forming it has been made much less difficult, and all microlepidopterists are greatly indebted to these two entomologists for their careful elucidation of this hitherto obscure group. I have bred *Lithocletis cerasicolella*, H.-S., in Chiswick, from cultivated cherry, but have not yet found the mines on peach. *L. spinicolella*, Zell.,

occurs on sloe at Sheen, Surrey, but I have not yet taken it on this side of the Thames. *L. concomitella*, Banks, is common on apple-trunks in Chiswick, both in its typical form and in var. *deflexella*, and I took one specimen with the left forewing almost typical and right var. *deflexella*. *L. blanchardella*, Fb., does not occur in Chiswick, as far as I am aware, but I have reared it from wild apple from Sheen. *L. oxyacanthae*, Frey, occurs on hawthorn, both trees and hedges, on both sides of the Thames, but *L. sorbi*, Frey, seems rare, as I have only taken it at Wimbledon, Surrey, off *Pyrus aucuparia*. Doubtless it would be more common if the food-plant were abundant. The other two British species of this group, I have not succeeded in finding. Though I have observed some mines on the underside of quince leaves, I have not yet been able to rear any moths. Last autumn I noticed here some mines in birch leaves, which, from Dr. Wood's description, appeared to be those of *Nepticula confusella*, Wood. They were submitted to Dr. Wood, who kindly confirmed my supposition.

The Abraxas grossulariata at the recent Maddison sale.

By (Rev.) G. H. RAYNOR, M.A.

The late Mr. Thomas Maddison was deeply interested in the two species to which I myself have given considerable attention during the last few years, I mean *Aglais urticae* and *Abraxas grossulariata*. I was not able to get up to town on February 23rd, to see the former (which to judge from the catalogue, must have been very fine), but, by March 9th, I had shaken off my attack of influenza, and put in a couple of hours at Stevens' before the sale began. After looking carefully through the *Abraxas grossulariata*, included in 103 lots, I came to the conclusion that they would probably fetch £70. How near the mark this estimate was is proved by the fact that they actually realised £62 4s. I do not possess a catalogue of the late Rev. J. Greene's sale, but, unless I am mistaken, his *grossulariata* produced £80, whilst £200 resulted from the 148 lots included in my own sale in the autumn of 1907.

Mr. Maddison for some years bred many thousands of *A. grossulariata*, not only from his own neighbourhood (Durham), but from larvæ obtained from many parts of the kingdom. It would, therefore, seem strange that he reared only one striking aberration, lot 225 (purchased at £3), were it not for the fact that most connoisseurs of this species are well aware of the great rarity of really extreme forms. Mr. Maddison himself, fully convinced of this truth, acquired most of his superior aberrations by purchase, and some few by exchange, but, although blessed with a sufficiency of this world's goods—for according to the published details of his will, he left £70,000—he did not, I am told, invest in the very best aberrations, having some such limit as £2 in his mind for any single specimen. Hence one can hardly be surprised that the highest price obtained was £3 (given for the above-mentioned lot), next to this coming two lots at £2 each, *viz.*, 160 and 177, both reared by Mr. Harwood, of Colchester. The only other lots that attained to £1 10s., were 229, at £1 15s., and 230, at £1 10s. These were both *nigrosparsata*, from Yorkshire, and the latter, although perhaps a trifle small, was a very good investment at the price. I may, perhaps, here go out of my way to remark that the highest price ever given at auction for an aberration of this species, was

8½ guineas for the unique ab. *cliftoniana*, lot 380 in Greene's sale. The next best price is £6 10s., given for ab. *chalcobares*, and also for ab. *nigrolutea* and ab. *melanozona*, all at my own sale.

The cataloguing of the "Maddison" sale specimens left a good deal to be desired, many of the *chalcozona*, *hazeleyensis*, etc., not being true representatives of those forms, whilst *albomarginata* certainly had not white margins, *subriolacea* and *semiriolacea* were only faintly tinted with dull brown, *cuneata* (at present only a MSS. name) were without the distinguishing wedge-shaped marks, and *lacticolor*=*flavofasciata*, was made distinct from it. I have thought it best to state these facts quite plainly, as otherwise your readers, who did not attend the sale, might infer a great slump in the prices. There was a fall in the prices of *lacticolor* and *varleyata*, with which forms many of the better collections are now supplied, but good specimens of either seem to be still worth about half a sovereign apiece. This may be taken as the present value of *varleyata*, which is fairly constant in markings, but *lacticolor* being itself liable to extraordinary variation, it is only the usual form of it that is to be estimated at this figure. The specimens, as a rule, were in good condition, and the bidding was sufficiently brisk, notwithstanding the absence of several well-known buyers.

***Arctia caia* ab. *clarki*, n. ab. (with plate).**

By J. W. TUTT, F.E.S.

Just before the death of the late Mr. J. A. Clark, he expressed a very strong desire to have an aberration of *Arctia caia*, bred by Salvage of Hailsham, described and figured. Accordingly, Miss H. S. Clark made a drawing thereof, which we have reproduced, and which we publish herewith.

The specimen is figured life-size, the forewings of a deep chocolate-brown, with only the faintest traces of the usual creamy-white markings. Carefully as the figure has been reproduced, it yet shows rather too prominently the paler markings of the forewings. The hindwings are of a yellow ground colour, the black spots easily traceable, but modified by a dark suffusion that covers all the centre of the wing, leaving only the marginal areas of the yellow ground colour. The thorax is of the same colour as the forewings, the bases of the front legs, and the abdomen red, the latter with the usual transverse black bands.

For this peculiar aberration, we have chosen the name *clarki*, in memory of an entomologist who was exceedingly interested in the aberrational forms of this (and other) species.

The Genitalia of the British Noctuidæ* (with plate).

Mr. Pierce has so long held a leading position among British lepidopterists as a student of the male ancillary appendages of British lepidoptera, that this long-expected volume will be most welcome to his confrères. As a first exposition of these structures in relation to a whole family of British lepidoptera, it makes a landmark in the advance of a more complete study of our British lepidoptera. Mr.

* "The Genitalia of the British Noctuidæ," by F. N. Pierce, F.E.S., pp. xii. + 88, pls. xxxii. [Published by A. W. Duncan, Liverpool. Price 7s. 6d.]

Pierce prefaces his book with an apology in the form of a page devoted to the aphorism that "He who never makes a mistake, never makes anything." This seems to us wholly unnecessary, the mistakes of commission are trivial and venial, those of omission are, of course, as large and numerous as we choose to make them, since no matter how much is given us, we are always ready to ask for more. Probably Mr. Pierce's real meaning would be better expressed by a sentence with which Mr. D. Christie-Murray closes his *Recollections*—"Everybody has failed, or half failed, who ever tried to do anything;" it is only mistakes or failures that can be classed under this philosophical view of human efforts with which we can credit him.

The figures, so far as we have compared them with actual specimens, are very accurate, and appear in all cases to present details abundantly enough to distinguish similar forms from each other very easily. How it might be if we had to deal with the thousands of known species of *Noctuidæ*, and not merely the 300 or so British, may perhaps be doubted, but this does not now concern us, since it is as a work concerning British species that we attach such high value to the volume before us. Placing the name on the plate against each species is a useful arrangement, though why some of them should be misspelt is not obvious. Mr. Pierce regrets that he did not include the penis in his figures; if it had been possible to exhibit perfect figures of the whole penis, *i.e.*, not only of the aëdœagus, but of the eversible membrane with its so remarkably varied spinous and other armature, his contribution to our admiration of these marvellous structures, and to scientific knowledge, would, indeed, have been immense; it would, however, have necessitated decidedly more than doubling the labour involved in what he does present to us. Figures of the aëdœagus alone, are not of anything like commensurate value, and even these involve in many cases much trouble to obtain precisely identical angles of view.

The first use of the male appendages as an important, and indeed indispensable, factor in classification and specific classification throughout a whole suborder, was by McLachlan, in the *Monograph of the European Trichoptera*, begun in 1874. He describes, and usually figures, them in all species, and uses them in his tables and definitions both of families and genera. In the Trichoptera, these organs can be seen and examined in the dry specimens usually without further preparation, so that there is much less difficulty in using them, for all descriptive purposes, than in the lepidoptera, where a specimen has to be more or less damaged, and a somewhat tedious process of preparation carried out, before the parts are available for any useful result. This is true, although Mr. Pierce tells us how a view, adequate for some purposes, may be obtained in a more simple manner.

The complications of these structures in the *Noctuidæ* have forced the author to give names to many of the detailed parts that have hitherto received no designation. When making so complete and elaborate a terminology (for the *Noctuidæ*), it is much to be regretted that, for parts already named, Mr. Pierce did not succeed in ascertaining what names (by priority) were already fixed. Buchanan-White and Gosse seem to have been the first to give any fixity to the names of the principal organs, and these ought to be retained. McLachlan's names are hardly applicable to the lepidoptera, where he recognises three pairs of lateral appendages, whilst, in the lepidoptera,

there is usually only one pair. For these Buchanan-White provided the name "harpagones" (harpago, singular), and this must remain. The word "clasp" has been taken as the English name of this piece. If an English name is not allowed, then we must say "harpago." Pierce calls this the "harpes"; this is a synonym that must fall, apart from its being a misapplication of a definite name given by Gosse. Lederer, so far back as 1857, called attention to these parts in the *Noctuidae*; he called the clasps, "afterklappen," and this name certainly holds priority in German; "valve" would probably be a more literal English translation than "clasp," but the latter may serve, as it has especially a very similar sound. Gosse's treatment of this organ is not very clear. For the "harpago" he uses the term "valves," yet distinguishes from them as a separate organ the armature of chitinous spines, hooks, etc., that often mark the inner surface of the "harpago." The harpago therefore, as the only consistent interpretation, consists of an outer fleshy "valve," and an inter-spinous portion, the "harpe." This differentiation seems inapplicable in many cases, in some of which only valves exist, in others only the harpe, whilst in the *Noctuidae* we have a complicated structure, in which both are present, but their respective limits difficult to define, and, with further differentiations, for which Mr. Pierce's abundant names seem to be a necessity. There is certainly a question whether the harpe be merely a process of the valve, or whether valve and harpe be not McLachlan's "appendices intermediae and inferiores" fused, a question for which those cases that seem to show two clasps on each side may not, perhaps, give the materials for an answer.

The "tegumen" of Buchanan-White is again a collective word and appears to include everything except the "harpagones" and the "penis." Gosse gives us some differentiation here, and gives us the name "tegumen," restricted to the dorsal portion of the 9th abdominal segment, with "uncus" for the dorsal portion of the 10th abdominal, which may be variously spined. Gosse is not very clear as to where the "scaphium" is, but it seems to be accepted that he meant the lower side of the 10th segment, that often presents definite processes between the anus and the penis. Jordan uses neither of these terms, but calls the parts tergite and sternite of the 10th abdominal segment. Pierce applies the name "scaphium" to a chitinous piece that occurs in the Catocalids, and hardly elsewhere; it is a line of hard tissue passing from the base of the "uncus" to the anal aperture. What he calls "subscaphium," is, in fact, the "scaphium," but he figures it too close to the anus (for most lepidoptera at any rate). His plate I shows his scaphium as a free process, and the anus as a free conical tube. Drawn correctly, the end of the "scaphium" and the end of the "anus" should coincide, since his scaphium is nowhere free. This piece wants a new name if it wants one at all. Pierce agrees with many observers (according, at least, to their figures), in representing the anus as a projecting cone; this is erroneous; it may project so in some degree when in use, but, in preparations, it projects so for no better reason than the gut of a caterpillar projects from the anus under pressure. The remarkable structure which exists in *Mamestra persicariae*, and which Pierce also calls the "scaphium," is neither the "scaphium" of Pierce, nor altogether the true scaphium. It has no connection with the "uncus" like the curious piece in the Catocalas, but it has a ventral

process that may be true scaphium; its main diamond-shaped portion has the anal aperture at its extremity. We have not seen such a piece elsewhere, it obviously deserves further study. What he calls the "vinculum," has been called the "saccus," which has the priority. The penis seems to have been the name given at first to the "ædœagus," under the impression that it was the whole organ. The name must belong to the whole intromittent organ, the solid portion being the "ædœagus" (called "penis-sheath" by Jordan), and the eversible membrane called by Jordan the "penis," by Pierce the "vesica." We think the latter a very unfortunate name, but it appears to have priority. Petersen calls it "Schwellkörper," whether originally or not, I do not know, but this seems no more a definite name than that frequently given it, of eversible membrane. The portion called by Pierce the "juxta," is called by Dr. Jordan the "penis-funnel." We do not recollect on what authority, but we have called this for a long time the "penis-sheath," a name found in German authorities as "penistasche," and "penis-scheide," but unfortunately, applied by Dr. Jordan to the "ædœagus."

The names of the parts of male genitalia in lepidoptera that have priority are:

9TH ABDOMINAL SEGMENT:

1. Tergite .. *Tegumen*.
2. Sternite
 2a carries .. *Clasps* (*Harpagones*), "after-klappen" (Lederer), divided into *Valves* and *Harpe*.
 2b sometimes prolonged upwards as *Saccus*, has at its posterior inferior border (centrally to appearance)
3. Penis-sheath, through which passes the Penis, consisting of—
 3a *Ædœagus*—a hard tube (the Penis of many, the Penis-sheath of Jordan).
 3b *Eversible membrane*—? erectile, the *Vesica* of Pierce, the Penis of Jordan.

10TH ABDOMINAL SEGMENT:

1. Tergite .. *Uncus*.
2. Sternite .. *Scaphium*.
 Centrally the Anus.

We may very possibly have overlooked some authorities, but, so far as we know, the above is correct.

Some of our readers, in noticing this first really comprehensive effort to deal with the subject as it affects the British fauna, may expect us to say a few words on the value of a study of these structures, from several practical points of view. The commonest question is—Can we depend on them to provide satisfactory specific characters? Though the answer to this question is broadly yes, we should like to say that it has its limitations, and that confident assertions of their value in all cases, which do not always hold good, have led many lepidopterists to the conclusion that they are really of very little use. The common sense of the matter seems to be, that these parts afford, just like any other structures of an insect, characters that may or may not be decisive. The chances are great that, when other characters leave much uncertainty, the appendages will clear up all doubt, but there are exceptions. There are other cases where the appendages, perhaps from insufficiently close or extensive observation, would leave doubt, when otherwise there is none. We may here refer to one common misapprehension. Everyone is ready to say or agree that any classification grounded on one character only is necessarily erroneous. But

it is also erroneous to call these organs *one* character. They manifest a multitude of characters; they present the structures, often most complicated and elaborate, of two most important segments of the insect's body. Of course, a satisfactory classification must take account of all characters, not only of one instar, but throughout the whole life cycle. These appendages, however, present nearly as large a group of characters as those usually used in making classifications, most systematists, probably from the necessary limitations to human mental contents, actually depending on comparatively few characters, so that the addition to the usual material for classification of a knowledge of these organs is rather doubling our resources than adding merely one item to them.

We are told that "classification" in this volume is "largely based on the genital organs," and the main descriptive portion of the work is headed "Classification of the *Noctuidae* based on the structure of the male genitalia." We are somewhat disappointed to find that Mr. Pierce does not seem to have had always courage to fully carry out the promise of these statements. We are told for instance that the *Bryophilidae* are strongly generic, this probably means that it forms a well-defined and separable group. Yet we find *Moma orion* placed as if it belonged to them. This, of course, the author does not mean, and must be regarded as an error of manner rather than matter, yet it is frequent as we go on, and not always easily recognisable. On the other hand we welcome the placing of *Demas coryli* with the *Cymatophoridae*: *D. coryli*, as the egg and other stages suggest strongly, is not a Cymatophorid, but the male appendages strongly suggest that it is, and it is most desirable that such a hint concerning a species of doubtful position should be emphasised. *Ligustri* is placed as an *Acronycta*, a separate genus being suggested for it. The genitalia, however, seem to provide the last straw, if one were wanting, to separate it from the *Acronyctas* altogether. We are frequently told that the genitalia say so and so, but the author will follow the sequence of the list. We miss any hint which the appendages bear out strongly, that *Mamestra (albicolon, monoglypha)* are closely related to *Leucania*, the latter being, in truth, Mamestras, coloured to suit their environment and habits. We should like also to have had Mr. Pierce's opinion as to whether the appendages suggest any relationship between the *Acronyctas* and *Xanthias*. We think much of this reticence, and especially the absence of a complete recasting of the list in some particulars, is due to a modesty that such an authority on the subject as Mr. Pierce, ought to be able to lay aside. His figures show that *Leucania* (central mass), *Apamea*, *Xylophasia*, and *Mamestra*, are very closely related, to the exclusion of *Nonagria* and some others which are led up to by way of *Hydroecia*. *Nonagria* certainly is not very near to *Agrotis*, but it is nearer than is *Leucania*: these relationships are not in accord with Mr. Tutt's forecasts in *Brit. Noctuae*, iv., p. xxv. In following out any such search for relationships, Mr. Pierce does not give us any clear lead, and it is more difficult to gather his actual opinion from the text, than to form one's own from the figures. One rather dislikes this, since Mr. Pierce's experience with the specimens must make comparatively simple to him what is more or less of a puzzle to his readers. One would have liked his discussion of such conclusions as we find in Tutt's *British Noctuae*, vol. iv., p. xxviii,

since it is obvious he would agree with some, and disagree with others, and would probably give us other results not there referred to. We might perhaps note the absence of *Diloba coeruleocephala*, and of the *Deltoides*. Although, therefore, we should have liked much more than we find in the volume, we are, nevertheless, very pleased to get so much as we do.

NOTES ON COLLECTING, Etc.

MOths ATTRACTED TO ELECTRIC LIGHT IN 1908: WITH NOTES ON LEPIDOPTERA FROM LLANBEDROG.—It may be interesting to note that the following species, among others, occurred near our electric light standards during the past season—*Amphidasys strataria*, March 28th, 1908; *Notodonta chaonia*, May 19th; *Cymatophora ocellaris*, July 2nd, *Cidaria associata*, July 3rd; *Cuspidia megacephala*, July 7th; *Ourapteryx sambucaria*, var. *Amphidasys betularia*, July 18th; *Lasiocampa quercus*, July 19th; two ♀s under one lamp, *Cossus ligniperda*, *Leiocampa dictaea*, August 4th; and *Charaeas graminis*, August 16th. A visit to Llanbedrog for change of air and scene in early June, was not productive of much in the way of lepidoptera—*Xylophasia rurea* was the only interesting Noctuid at sugar; *Aspilates strigillaria* occurred on some rough ground at a considerable elevation. One or two larvæ of *Lencania littoralis*, *Actebia praecox*, *Anerastia lotella*, *Lasiocampa quercus* var. *callunae*, and *Depressaria nervosa* complete the short list.—F. G. WHITTLE, 7, Marine Avenue, Southend. March 24th, 1909.

LEPIDOPTEROLOGICAL NOTES FOR 1908.—There are two small errors in my notes published in your last number, which I should like to correct, both on page 56. I am made to say that a pairing of *N. lapponaria* took place 24 hours after emergence of the male. This should read *female*: and my object in mentioning the matter was to direct attention to the various times which elapse in different species after emergence of the female before copulation takes place. Further on, I am described as searching for *Egeria sphegiformis* on the Sussex Downs—a most unlikely spot to find this species. I wrote, or at least intended to write, *E. andrenaeformis*, whose foodplant, *V. lantana*, is, of course, common on the chalk downs.—PERCY C. REID, Feering Bury, Kelvedon. March 17th, 1909.

THE HYBERNATING STAGE OF BRENTIS AMATHUSIA.—With reference to the newly-hatched larva of *Brentis amathusia* mentioned (*Ent. Rec.*, xx., p. 226), I found this morning that the hibernating larva had died, but so recently, that it had still the appearance of being alive till closely examined.—T. A. CHAPMAN. March 11th, 1909.

SCIENTIFIC NOTES AND OBSERVATIONS.

GYNANDROMORPHS OF PLEBEIUS ARGUS (ÆGON).—We are just now collecting all the information available concerning the gynandromorphous examples of *Plebeius argus* (aegon) (and other Lycaenids) in the collections of British (and Continental) lepidopterists. Some sixteen examples of *P. argus* are properly recorded so far as showing which parts superficially are ♂, and which ♀; others again recorded as such, are possibly only blue-tinted ♀s, but there are a number of records that suggest a mine of unrecorded material, the records entirely useless

scientifically, because of their incompleteness and absence of detail. Mr. Sydney Webb records (*Ent.*, xxi., pp. 133-5) "several gynandromorphous specimens" of *P. aegon* in his collection, presumably, from the context, all taken near Dover, in 1887, a most unusual occurrence and worthy of more extended notice. Barrett, too, observes (*Brit. Lep.*, i., p. 70) that "Webb has gynandromorphous specimens in his collection, some with the right side ♂, others the left, and, of these, some have dashes of bright blue in the brown of the ♀ side," etc. Now these extracts show that here, in one collection alone, is an excellent lot of material that merely wants carefully recording. Again we find (*Ent. Record*, viii., p. 272), that, at "Stevens' sale-rooms," on October 27th, 1896, several gynandromorphous examples of *P. aegon* were sold in the "Briggs' collection" at 7s., 6s., 6s., 8s., 8s., and 22s. per pair. With the exception of one of these, none had been previously recorded by Mr. Briggs, who, by reference to the sale catalogue, finds that these lots (106-111) were bought respectively by Messrs. Mason, Maddison, Booth, Sheldon, Maddison, Booth. Of these, Mason's and Maddison's have since been resold. The four from the latter's collection were bought by Mr. L. Newman, and he reports: "two of the *aegon* have the right side ♂, the left ♀, one is very mixed, and the fourth is not a hermaphrodite at all." My entomological friends are exceedingly good in giving me information if I write them individually, but time is wanting to do this. It is simply impossible. Will they not be equally kind in sending me, at once, details of the gynandromorphic "blues" in their collections, just noting which side is ♂, which ♀, or in more complicated cases, the ♂ and ♀ parts, carefully discriminating what are simply blue-tinted ♀s, together with all available data—the original collection they came from, if nothing further be known? These details are important. No doubt some day the specimens (especially if properly authenticated) will be worth a great deal of money, as information regarding them becomes more and more necessary. It is quite impossible to me to write to the owners of all our best collections, but I should be thankful for detailed information of the examples, in the collection of anyone, and if they will only just send me the needed facts, I will make the best use I can of the material collected.—J. W. TUTT.

CURRENT NOTES.

Mr. Champion adds *Calodera rufescens*, Kraatz, to the British list on the strength of examples taken at Sandown, Isle of Wight, June 1898, and at Colchester, in 1906.

Mr. E. R. Banks describes a form of *Scoparia ambigualis* from the New Forest as ab. *crussi*: especially characterised by the snowy-whiteness of the ground colour of the forewings, as seen especially in the subbasal and subterminal areas, which throw the dark median area into strong relief, and is exactly parallel with *Scoparia mercurella* ab. *portlandica*, and *S. dubitalis* ab. *purbeckensis*.

The secretary of the City of London Entomological Society writes to say that the error concerning the misuse of the name *Tephrosia biundularia*, in the *Entom. Record*, p. 176, is not his. He complains, however, of the synonymy, which was unfortunately tangled for us more than a century ago, and from which Mr. Prout released us in his

article "The *Tephrosia* tangle" (*Ent. Rec.*, viii., pp. 76 *et seq.*). His conclusions were really very simple, *viz.*, that *Tephrosia bistortata*, Goeze = the *crepuscularia* of the British list, whilst *Tephrosia crepuscularia*, Hb. = *biundularia*, Esp., and the *biundularia* of the British list, so that the insect we had hitherto called *crepuscularia*, became *bistortata*, and the one we had called *biundularia*, became *crepuscularia*. He further pointed out that the former species was doublebrooded; that the first brood was the *abietaria* of Haworth, Stephens, Doubleday, etc., whilst the second brood was the *consonaria* of Haworth, Stephens, and Wood, whilst the dark black-brown form of this species was *ab. passetii*, Thierry-Mieg. The latter species, it was pointed out, was singlebrooded, and its two dark forms were known as *ab. delamerensis*, White, and *ab. nigra*, Thierry-Mieg.

This was followed up by an extensive article, "A critical resumé of the arguments for and against *Tephrosia bistortata* (*crepuscularia*), and *T. crepuscularia* (*biundularia*) being considered distinct species," which was commenced in the *Ent. Rec.*, viii., pp. 281 *et seq.*, and continued in vol. ix., pp. 6 *et seq.*, 28 *et seq.*, 55 *et seq.*. This, in its turn, was supplemented by a further series of articles by Mr. W. Hewett, *Ent. Rec.*, vol. ix., pp. 107 *et seq.*; by notes on their eggs (*Ent. Rec.*, ix., pp. 149 *et seq.*); by hybrid experiments between the species, by Dr. Riding and Mr. Bacot (*Ent. Rec.*, ix., pp. 149 *et seq.*), the details of which we ourselves summarised, and which were in due course published in the *Transactions of the Entomological Society of London*. Further notes were published on the distribution of these species in England, Wales, Scotland, and Ireland, in the *Ent. Record*, vol. x., also further hybridity experiments, until, at last, we could no longer find room for the notes and papers that our contributors continued to send us on the species, all of which, however, went to prove the conclusions arrived at in the "Critical resumé" already referred to.

It follows, therefore, that there is no need whatever for the merest tyro ever to go wrong over these species or their names. If it happens, it must be entirely due to a failure to appreciate the fact that every lepidopterist of standing uses *T. bistortata* as the name for the doublebrooded species, and *T. crepuscularia* (*biundularia*) as the name of the single-brooded species. We have no space to discuss the rights and wrongs of the matter, or individual opinions on the species. The facts of their life-histories and their names have already been fully published, and are at the disposal of every lepidopterist who cares to borrow the necessary literature from the library of the society to which he belongs. At the same time we quite exonerate the secretary from participation in the error.

Mr. R. Verity has published a most interesting paper (*Boll. del. Soc. Ent. Italiana*, 1908) on the Rhopalocera of the Isle of Elba. This little island seems to have produced 42 species during his visit (July, 1908). The most interesting species are perhaps *Gonepteryx cleopatra*, *Charaxes jasius*, *Dryas pandora*, *Hipparchia neomyris*, *Coenonympha corinna*, *Bithys quercus*, *Lampides boeticus*, *Raywardia telicanus*, and *Gegenes nostrodamus*. *Thymelicus acteon* is noted as abundant everywhere. He further gives details of the most productive spots in the island for collecting purposes.

The meeting of the Entomological Society, held on March 15th, was particularly well-attended, lepidopterists turning up strongly to

hear lectures by Mr. Tutt and Dr. T. A. Chapman on *Plebeius argus* (*aegon*) and *P. argyrogynon*, two superficially similar blue butterflies that are usually supposed to be difficult to distinguish, and one of which is common in Britain. The lectures were to be followed by a discussion.

Mr. Tutt discussed in detail the synonymy, the variation and local races, and the distribution of the species, concluding with a comparison of the differences in the species that are most patent to the ordinary observer with the naked eye, or by simple microscopic preparation. Besides the races of *P. argus* (*aegon*) inhabiting central and northern Europe and the British Islands, divided chiefly into plain, mountain, heath, and moorland forms, he dealt at length with the Spanish races *hypochiona*, Ramb., *bejarensis*, Chapm., *casaicus*, Chapm., *branuelasensis*, n. var., *vigensis*, n. var., comparing them with the eastern races *koreana* (a giant form like *bejarensis*), *micrargus*, and *pseudaeagon* : he then considered the Pyrenean forms, including var. *pyrenaica*, n. var. (δ well-banded), and its ab. *hypochionoides*, n. ab. (δ with narrow marginal bands) occurring together at Gavarnie, etc.; he compared var. *corsica*, Bell., with the British moorland form var. *masseyi*, Tutt, and then dealt with eastern and central Asiatic forms, including *orientalis*, n. var. (with its ab. *bella*, H.-Sch.), *sifanica*, Gr.-Gr., etc. Among other important items he noticed the misapplication of the name *aegidion*, Meissn. (= *philonomus*, Bergstr.), to *P. argyrogynon*, *aegidion* being undoubtedly a form of *P. argus* (*aegon*).

Mr. Tutt was followed by Dr. Chapman, who exhibited a large number of excellent lantern slides, made by Mr. F. Noad Clark from his (Dr. Chapman's) microscopical preparations. The remarkable "tibial" spine of *P. argus* (*aegon*), and the variable (yet wonderful characteristic) ancillary appendages of the same species, were compared with the same structures in *P. argyrogynon* (and those of half a dozen other allied species); the structure of the newly-hatched larvæ of both species, and the structure of the eggs, etc., all pointed to a difference not only of species, but to differences that might in some respects, almost suggest the bulk of the Plebeiidæ to fall between them, although we believe the differences may be explained in other ways. Altogether, Dr. Chapman's illustrated discourse probably provided more facts for digestion, and mental pabulum for consideration, than any lecture that has been given in the Society's rooms for a very long time. It was 10 p.m. before the lecturers had finished, and the discussion (if any) was adjourned to the next meeting.

At the same meeting Mr. A. Janet (Paris) and Mr. G. Severin (Brussels) were present; these gentlemen, with Dr. Horn (Berlin), having come to London to deliberate with the President, and certain Fellows of the Entomological Society, concerning the International Entomological Congress that it is proposed to hold in Brussels next year.

In the *Entom. News* (p. 59), Mr. F. X. Williams gives some interesting details of the life-history of a species called "Pterophorus baccharides." Larvæ were found on *Baccharis pilularis*, in San Francisco, boring a smooth cylindrical passage in the stem, terminated by an oblique opening, from which a quantity of pale-coloured frass was extruded; the galleries may be in the smaller stems or in the main

trunk ; on tall shrubs the larvæ may be found working high up in the stems. The pupa, which is very active, lies some distance from the bottom of the gallery, but may move considerably therein. Half-grown and nearly mature larvæ are very plentiful in winter. The wood-boring habit of the larva is interesting, but Williams says is not unique among the *Alucitides*.

Mr. Oscar Schultz sends us his fifth contribution to a " Catalogue of gynandromorphous lepidoptera," reprinted from the *Ent. Zeits. Guben*. The new part contains records of 125 examples—51 butterflies, 17 Sphingids, 36 Lymantriids, Arctiids, Lachneids, Dimorphids, Attacids, and Notodontids (still all lumped together as Bombyces), 12 Noctuids, and 9 Geometrids. This brings the grand total of recorded examples up to 514, 162, 379, 41, and 103 in these groups respectively.

The last meeting of the Entomological Club was held on the evening of March 12th, at " Wellfield," Lewisham, at 6.30 p.m., when the members and friends were received by Mr. and Mrs. Adkin. Tea was served by Mrs. and Miss Adkin, and then some time was spent in looking over some of the special things in Mr. Adkin's excellent collection. Supper was served at 8 p.m., the following members and friends being noted. Messrs. R. A. Adkin, Armstrong, J. E. Collin, W. Distant, H. St. J. K. Donisthorpe, T. Hall, A. Harrison, H. Main, G. T. Porritt, A. Sich, R. South, and J. W. Tutt. Many invitations unfortunately had to be declined owing to the ill-health that appears to be so prevalent just at present.

Mr. Frohawk describes (*Ent.*) the general features of the life-history of *Argynnis laodice*, from which we learn, among other interesting items, that the larva hibernates in the egg-shell, as in the case with *A. adippe* and *A. niobe*, and not outside the egg-shell, as in *A. aglaja*. The larvæ seem to hatch (February 19th) almost at the same time as those of *A. adippe*. The coloured plate illustrating the notes, the work of Werner and Winter, Frankfort-on-Main, appears to be exceptionally well done, and does credit to Mr. Frohawk's careful drawing.

The second volume of "The Moths of the British Isles," by Mr. R. South, has now been published, and continues the good features of the preceding one, the plates being on the whole equally well-done, and letterpress as much as could be got into the limited space at disposal. Some of the colour-work is very satisfactory, and, of the black and white reproductions, the half-tones from Mr. Main's photographs, and the life-like appearance of some of the larvæ drawn by Mr. Sich, are alike excellent. Mr. South still maintains the unfortunate union of *Tephrosia bistortata* and *T. crepuscularia* (*biundularia*), whilst in another place (p. 116), Mr. South doubts Mr. Prout's determination of *Acidalia dilutaria* (misspelt *dilataria*), Hb. ; he also advances the (to us) untenable theory that *Anthrocera stephensi* (*hippocrepidis*) may be the hybrid offspring of *Anthrocera trifolii* and *A. filipendulae*, in which case there must be, in some localities, every year, hundreds of hybrids, with the same facies. We took nearly 400 in two days in 1893, in one field, and have often seen them as numerous in other years. On the whole, however, the book is remarkably free from these little walks into the region of doubt, an excellent feature in a book essentially intended for beginners.

One little paragraph in the " preface " of this book, however,

hardly appears to us to ring true; it is that which refers to the reason for not publishing a third volume to include an instalment of the "Micro-lepidoptera." It is, of course, true that these could not have been put into vol. ii, which is full already, nor into one volume more, beyond ii; one learns early in life that the attempt to put a quart into a pint pot leads to disaster, but, at any rate, the Crambids, Pyralids, Plumes, Hyponomeutids, Depressariids, and the groups that make up Chapman's *Pyraloidea*, would have made another large enough volume, whilst their reproduction would have been far easier than some of the Geometrids already pictured. One suspects that the truth here peeps out in the statement that the so-called "micro-lepidoptera" are interesting only to a "limited number of students," and that the series stops, not from any inability to continue, either on the part of author or artist, but from the doubt that the next volume might not pay so generously. If so, it is unfortunate, for all these popular works on lepidoptera that stop short at the Noctuids and Geometrids, whilst adding to the number of collectors who kill thousands of specimens of the few superfamilies of larger moths, offer nothing to attract the "nature study" votary (whom this series is primarily stated to be intended to help!) into the paths which lead to the life-histories of the smaller species, which are less persecuted by humans, and which are entrancingly interesting once the "nature-student" proper, apart from the collector, learns to know of their existence.

May we not hope that the great success of vols. i and ii will lead the publishers to allow Mr. South to give us vol. iii, and that some of the financial success that vols. i and ii have surely earned, be expended on really supplying "nature-students" with something they want, and which, at present, they cannot get anywhere! The reason why so few study the "smaller fry" (? some of them are pretty large), is certainly because there is no popularly-written and illustrated book to put them in the right path. Nowadays it would seem, books are most often not given to the world by publishers to attract students, but to supply superficial reading for those who are already studying. May we not hope that the publishers of *The Moths of the British Isles* will rise in a third volume superior to this common but undesirable practice?

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—March 3rd, 1909.—MENDELISM IN *ACIDALIA VIRGULARIA*, Hb.—Mr. L. B. Prout, on behalf of himself and Mr. A. Bacot, brought for exhibition a very extensive series of *Acidalia virgularia*, Hb., bred in ten successive generations from various crossings of the London and Hyères races, which had been undertaken with a view to the further study of Mendelism. The results showed non-Mendelian inheritance, there being no segregation with pure and hybrid forms in definite proportions, and thus supported Mr. Bacot's opinion that such were only to be expected in cases of hybridisation of forms in which natural selection had virtually eliminated intermediates, or, in other words, that apparent Mendelian phenomena were manifestations of selective purity, rather than of gametic purity. Mr. A. Harrison pointed out that in similar experiments conducted by himself with Mr. H. Main with British *Pieris napi*

$\times P.$ var. *bryoniae* from Switzerland, carried through three generations, they had quite failed to obtain Mendelian proportions, but in the case of *Aplecta nebulosa* the Mendelian proportions were absolute (see *Proc. Ent. Soc. Lond.*, 1907, p. liv., etc). PUPAL COLORATION OF PIERIS.—Mr. H. M. Edelsten showed a living pupa of *Pieris rapae* attached to a blade of *Cliria*, the deep green pigment assimilating closely to the coloration of the leaf. POSSIBLE HYBRID ANTHROCERA.—Mr. R. Adkin exhibited what appeared to be a hybrid between *Anthrocera filipendulae* and *A. achilleae*, taken by Mr. A. W. Renton in the neighbourhood of Oban, N.B. Mr. J. W. Tutt expressed doubt as to the specimen being a hybrid. BIRDS AS A FACTOR IN THE PRODUCTION OF MIMETIC RESEMBLANCES IN BUTTERFLIES.—Mr. G. A. K. Marshall explained that one of the chief criticisms directed against the theories of mimicry was to the effect that, on the whole, birds did not destroy butterflies to any appreciable extent; he had, therefore, collected together all the available evidence bearing on the question. As indicating the extent of such observations, it was stated that these records refer to a considerable number of species of both birds and butterflies, as might be judged from these approximate figures: Palaeartic Region: 33 birds, 34 butterflies; Ethiopian: 26 birds, 26 butterflies; Oriental: 27 birds, 46 butterflies; Nearctic: 46 birds, 20 butterflies. Unfortunately in the Neo-tropical Region, from which the greatest amount of evidence might have been expected, such exact observations had been almost entirely neglected. It was intended that the negative evidence on this subject, which appeared to have been very generally accepted, was really of very little scientific value, because in no case had it been shown that the observer had any adequate knowledge of the actual food-habits of birds, or that any careful and exhaustive inquiry had been made into the subject. Instances were also cited to show how very easily destruction of this kind might be overlooked; while negative evidence derived from an examination of the contents of the stomachs of birds might be very misleading, owing to the fact that, in so many instances, the butterflies' wings are not swallowed, so that any recognition of the remains becomes extremely difficult. Finally, it was urged that the large body of evidence resulting from merely casual observations indicated that the assumption that birds do not eat butterflies to any extent is certainly premature, and that a fuller inquiry will probably show it to be entirely unfounded. Mr. W. Sharp maintained that the actions of the sparrow, as a domesticated bird, were not evidence for conditions which exist in the case of purely natural species. Dr. T. A. Chapman suggested that the paucity of observations on the point was largely due to the shyness of birds eating in the presence of human beings. Mr. W. J. Kaye said that he had never observed birds attacking butterflies in tropical South America, and Commander J. J. Walker gave similar testimony with regard to the many Australasian and other oversea localities visited by him.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 25th, 1909.—NEMORIA VIRIDATA AND CELASTRINA ARGIOLOUS. Dr. Hodgson exhibited series of *Nemoria viridata* taken in 1906-8, in Lancashire and Surrey, and commented on the forms shown, including ab. *concarilinea*. He also showed a third brood specimen of *Celastrina argiolus*, in which the blue was almost wholly replaced by dull grey. YELLOW AB. OF EUCHELIA JACOBÆÆ, ETC.—Mr. Main, for Mr. Baldock,

a yellow variety of *Euchelia jacobaeae* from Norfolk, and three fine specimens of the rare *Papilio mechowianus* from central Africa, *ANARTA CORDIGERA*.—Mr. McArthur, specimens of *Anarta cordigera* from Rannoch, and read notes on its habits and habitat. *GYNANDROMORPHOUS PAPILIO*.—Mr. H. Moore, a gynandromorphous example of *Papilio clearchus* (?) from South America, right side ♂, left ♀. *ABERRATIONS OF LEPIDOPTERA*.—Mr. Newman, *Aglaia urticae* var. *ichnusa*, with sagittate blue spots on the hindmargin, *Dryas paphia* with much radiated black markings, "black" *Limenitis sibylla*, a straw-coloured aberration of *Rumicia phleas*, the unique pale grey form of *Smerinthus ocellatus* bred by him in 1902, and several *Hesperia malrae* ab. *taras*.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—March 2nd, 1909.—
VARIATION OF RUMICIA PHLEAS.—Various European and extra-European series (1) examples lighter in colour, and with black markings less pronounced than in normal English specimens, from Sicily (? spring brood); (2) mostly var. *eleus*, or abs. approaching thereto from Spain (? summer brood); (3) with black markings accentuated both in size and depth of colour, but with the ground colour clear and bright, from Teneriffe; (4) specimens with ground colour, and others with the same suffused with black, from Japan; (5) with the whole ground colour completely obscured with smoky suffusion, from India, Dr. T. A. Chapman. English specimens with copper marginal band on hindwings, broken up into alternate dashes of copper and black, Messrs. S. J. Bell, and L. W. Newman. A specimen with hindwings entirely black, from Darenth, and var. *elens* from Bexley, Mr. V. E. Shaw. **CAMPTOGRAMMA FLUVIATA**, from a south Devon ♀. The larvae (all save two) pupated on one day, and the imagines (save two) all emerged during one day. Mr. H. M. Edelsten. **C. FLUVIATA LARVE**, nearly full-fed, having been reared on dandelion in a hot-house. **ARCTIA CAIA** ab. (for Mr. South); with usual black markings on hindwings, restricted to three marginal blotches, Mr. J. Riches. **PHIGALIA PEDARIA**, series bred from wild Yorks melanic female; about 10% of the offspring were melanic, a few light-coloured, and the rest intermediate, forms, Mr. A. J. Willsdon. **March 16th, 1909.** **STAUROPUS FAGI**, taken at Hammersmith in 1863, Mr. A. W. Mera. **CAMPTOGRAMMA FLUVIATA**, bred from Bournemouth female, including many examples with interrupted fascia. **THE CAUSE OF THE SCARCITY OR ABSENCE OF A SPECIES (OF LEPIDOPTERA) WHICH SOMETIMES FOLLOWS A SEASON OF EXCEPTIONAL ABUNDANCE IN SOME PARTICULAR LOCALITY**: Dr. T. A. Chapman opened a discussion on the subject, and advanced, as a possible explanation, the theory that abnormal abundance might be due to the temporary inactivity of some selective or destructive force. Comparatively unprotected individuals would be thus allowed to escape, and their unprotectedness would be transmitted to, and accentuated in, subsequent broods, then, when the selective agency again became active, the race would be exceptionally vulnerable to its attacks, and the species would be nearly exterminated until it was gradually selected up to the average of its protective potentiality, and its normal number so re-established.

ERRATA.—Page 56, line 18, for "♂" read "♀" Page 56, line 21, for "sphegi-formis" read "andreniformis." Page 66, line 11, for "Aglaope" read "Aglaope." Page 73, line 32, for "Ann. Soc. Ent. Fr., lxxviii., pp. 709 et seq." read "Ann. Soc. Ent. Fr., lxxvii., pp. 209 et seq." Page 76, line 45, for "Tephrosia" read "Tephrosia."

VOL. XXI.

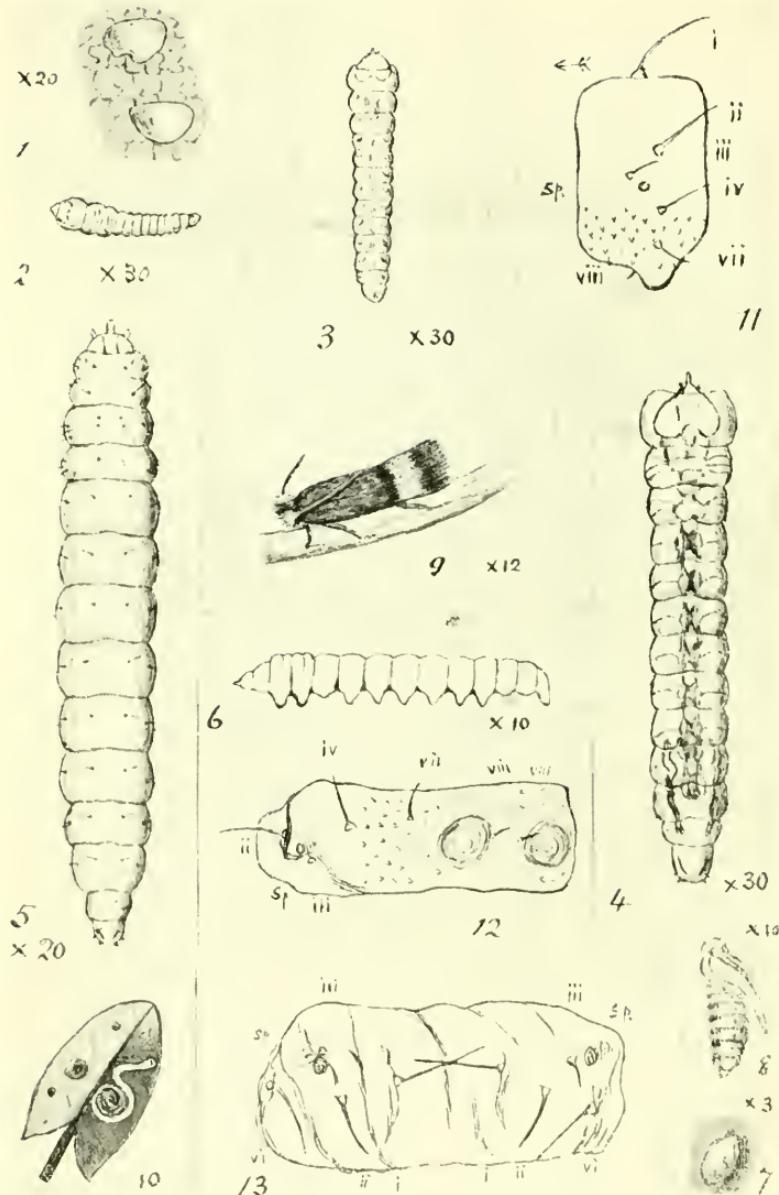
PLATE VIII.



Photo, J. N. Keynes.

ABERRATION OF *POLYGONIA C-ALBUM*.

The Entomologist's Record, etc., 1909.



Det. A. Sich.

LIFE-HISTORY OF *NEPTICULA ACETOSAE*.



Photo, Hugh Main.

ABDOMEN OF *CENOBIA RUFIA*, HAW., ♀, SHOWING APPARATUS FOR CUTTING LEAF BEFORE EGG-LAYING $\times 27$.

The Entomologist's Record, etc., 1909.

Butterflies in Switzerland in 1908 (with plate).

By J. N. KEYNES, M.A., D.Sc., F.E.S., and G. L. KEYNES.

The chief object of our Swiss tour in 1908 was an attempt upon the *Apaturidae* at Eclépens, but our efforts elsewhere were also rewarded by several interesting captures and observations, which it may be worth while to record.

We began our collecting at Sion on June 24th, and worked on the morning of that day in the valley; here *Polyommatus amandus* was plentiful, but very worn, and it was difficult to get any males worth keeping. We were somewhat surprised to find both *Apatura iris* and *A. ilia* among the trees, as we had supposed it to be still too early for these species. This served as a useful warning that the season was ahead of its normal time—at least a week in the lowlands—and we decided to visit Eclépens some days sooner than we had originally intended. The only other captures of interest were a minute specimen of *Plebeius argus (aegon)* var. *alpina* (17mm.), and a very pale yellow form of *Coenonympha pamphilus* ab. *pallida*. In the afternoon we searched above Sion towards Ormona for *Melitaea deione* var. *berisalensis*, of which we took five males and four females, all in good condition. This species appeared to be very local, but it would doubtless have been fairly plentiful had not the sun soon become clouded over. *Pontia daplidice* was flying in some numbers, but in very worn condition.

The next day, June 25th, we walked up the Vex road, in the hope of finding *Agriades meleager*, but in this we were disappointed; we were doubtless too early. On the other hand, we took *Polyommatus amandus*, in better condition than on the previous day, *Nordmannia (Thecla) ilicis* ab. *cerri*, *Brenthis daphne*, and *Melitaea phoebe*. On the whole, however, this road was found to be unproductive, and we left it to pay another visit to the valley, where we took *Melitaea athalia*, *M. aurelia*, *Limenitis camilla*, and another specimen of *Apatura iris*. In the afternoon we took train to Martigny.

June 26th was spent under the cliffs between Martigny and Vernayaz, and a wonderful hunting-ground this is. *Polyommatus amandus* was very plentiful and in good condition; it did not seem to differ from the Sion race in size or colouring. We also obtained a splendid series of *Brenthis daphne*, and were glad to get specimens of *Erynnis althaeae*, *Lowea alciphron* var. *gordius* ♀, *Polyommatus hylas*, *Klugia (Thecla) spini*, *Apatura ilia*, and *Satyrus Hermione*. *Coenonympha iphis* was plentiful, but very worn. In the evening we moved on to Lausanne.

During the next three days, June 27th-29th, we had our first experience of the wonders of Eclépens, and we were in no way disappointed. Both *Apatura iris* and *A. ilia* were out, not yet, it is true, in very large numbers, but they were all absolutely fresh, and we obtained a very fine series. We worked chiefly on the Oulens road, but on the third day (June 29th) we found *A. ilia* to be much more plentiful on the lower road. *A. ilia* var. *clytie* or *eos*, we found to be very much less common than the type. We took one specimen intermediate between var. *clytie* and the type, the hindwing only showing the brown suffusion. We saw no more than one female Apaturid and no *A. iris* ab. *iole*, but we should, perhaps, have been more likely to

find these a week later. Mr. Foljainbe, who preceded us by a few days, found the *Apaturidae* to be comparatively scarce; he also discovered both a fullfed and a half-fed larva of *A. ilia* on the poplar bushes. When the first greed of the collector had been satisfied, we were able to learn much of the habits of these species, but they are too well known to need description here.

We were also much struck by the habits of several other species which were plentiful at Eclépens, notably by those of *Limenitis sibylla*. This species occurred in enormous numbers, and its habits appeared to be almost identical with those of the *Apaturidae*; it was to be found settled in large numbers on the road or on droppings, it was even more fearless than the *Apaturidae*, and it would return constantly to the same place. These habits were shown in a lesser degree by *Eugonia polychloros*, by *Polygonia c-album*, and even by *Pararge achine*, and so remarkable was this resemblance that it occurred to us that it might be an instance of local mimicry, the habits of the *Apaturidae* being mimicked by *L. sibylla* and, though much less probably, by the other species mentioned. Professor Poulton, on the other hand, believes *Limenitis* to be a specially protected genus, and that in respect of markings the rôles of model and mimic as regards *Limenitis* and *Apatura* are reversed. These two views are, however, not opposed, since, taken together, they fit in with the Müllerian theory of mutual benefit. A fair amount of evidence might be adduced in favour of the views indicated above, but more extensive and accurate observations are necessary before the former can be accepted. Additional evidence might be obtained by observing the habits of *L. camilla*, which was only just beginning to appear when we left. Another possible explanation of the behaviour of *L. sibylla* may be an exaggerated need of moisture, as this species is sometimes to be found resting on the ground in most continental localities where it occurs.

Among the other species taken at Eclépens were *Parnassius apollo* var. *pseudonomion*, *Nordmannia* (*Thecla*) *ilicis*, and var. *cerri*, *Strymon* (*Thecla*) *pruni*, *S. acaciae*, *Limenitis camilla*, *Brenthis ino*, and *Coenonympha arcania* (very abundant); the Ruralids (Theclids) were for the most part worn. The most interesting capture of all was a magnificent aberration of *Polygonia c-album*. In this specimen, both sides of which are figured in the accompanying plate viii., the markings on the upperside are represented by four black blotches, one of which occupies almost the whole of the hindwing. The underside is also peculiar, and the comma-mark takes the form of an F. The aberration corresponds more or less with the description of the form called ab. *F-album* in Mr. Wheeler's book. Mr. Wheeler, however, informs us that the figures of *F-album* which he has seen do not indicate that the black markings on the upper side are more extensive than in the type, though a certain amount of confluence has taken place.

It will be seen that the entomology at Eclépens is of an extremely interesting character, but we suffered a good deal from the heat, and it was somewhat of a relief to journey on June 30th to the fresher air of Bérisal, where we remained until July 4th.

(To be concluded.)

Notes on the Life-History of *Nepticula acetosæ*, Stt. (with plate).

(Concluded from vol. xx., p. 252).

By ALFRED SICH, F.E.S.

If the larva of *Nepticula acetosæ* finds a suitable situation for the cocoon, it commences spinning a very short time after leaving the mine, but more often it wanders some distance before settling down to spin the cocoon. At first the larva spins a net-work of a rather open nature, which probably defines the boundaries of the structure. This is then filled up from within, and after some hours a much closer net-work is visible. This is again filled up, so that after some hours (twelve in one case, I noted) the larva has completely hidden itself in the white cocoon. The cocoon, entirely of silk, is rather flat, generally almost pointed at one end, and rounded at the opposite end. It appears to be formed of two valves, joined together at the pointed end and up the sides, but less firmly joined at the broader end. Through a slit in the broad end the pupa thrusts itself on emergence. At the bottom of the pointed end, the old skin of the larva may be found. This, from its now contracted state, gives the setæ, which do not contract, an exaggerated appearance, so that the skin appears to have belonged to a quite hairy larva. In the summer-time the transformation of this species is rapid. Some larvæ, which were still in their mines on August 15th, 1908, produced imagines on August 28th. In warm weather there appears to be a succession of broods. I took larvæ still in their mines on October 10th, but did not search after that date. This species hibernates in the pupal stage. I have not yet seen the imago in the field, but those I had in captivity were fond of hiding out of sight, and very quick in their movements.

There are yet one or two points concerning the larval mines to be mentioned. The mine takes the form of a fairly circular patch containing about seven concentric turns of black excremental lines. The mines are usually dextrally coiled, but may also not rarely be found sinistrally directed. The last three-quarters of the last whorl of the circular part of the mine, is wider and paler, and develops suddenly into the serpentine portion, which is variable in length, and terminates just beyond the semicircular slit by which the larva quits the mine. If the two cuticles of the leaf be separated where a mine has been formed, it will be noticed that in the circular blotch-part of the mine, the excrement is nearly all deposited on the upper cuticle, whereas in the serpentine or gallery-part of the mine, the excrement is all on the lower cuticle. The first arrangement is that adopted by the larva when in any of the first three stadia, and the second, that made use of in the fourth stadium. The parenchyma of the sorrel-leaf is usually stained a deep red for some space round the mine, but not all red blotches in sorrel-leaves are due to *Nepticula acetosæ*. Some appear to be caused by a leaf-fungus, and others by the natural process of decay. The leaves, especially of the sheep-sorrel, in autumn, are often entirely red, and where the plants grow thickly, add colour to the landscape.

LARVA.—*First instar*: Head very small, almost enveloped in the large prothorax. Meso- and metathorax both large, but less than the prothorax. The abdominal segments are smaller than the metathorax,

and taper gradually towards the 10th abdominal, which is bluntly rounded. Beneath the mesothorax there is a transverse ridge or swelling, which seems to be the initial stage of the proleg-like projections which appear in the last instar. The metathorax is similarly furnished, but there is no trace of any such prominence on any of the other segments. Both the meso- and metathorax are swollen dorsally, and the enlarged state of these two segments, aided by the ridges beneath them, no doubt offer a good thrusting-block to the larva while it is feeding, as well as forming, anyhow, part of the means of progression. Segmental divisions very well marked. The colour of the head is very pale brownish-ochreous, and that of the body pale grey. The dorsal canal is light green. Width of head 0.09mm., and the length of the larva is 0.7mm. No setæ were found, though search was made by means of a high objective.

Second instar: Larva rather flatter than in first instar. The thoracic segments are not so large in proportion to the abdominal, though the prothorax appears wider in proportion in some specimens. The pads beneath mesothorax are more clearly developed than in the first instar, but they are more or less connected by a raised ridge, as are also those on the metathorax. The head is pale brown, with the usual lines darker. The spinneret is very long. The body is at first grey, but becomes later bright yellow. The dark ganglia can be seen, but they are not so conspicuous as in the third instar. The renal organs (?) are easily seen, and yellow in colour. There is a pair of curved grooves situated on the anterior portion of the segments in the subdorsal region. There are no prolegs on the abdomen. The length of the larva is 1 $\frac{1}{4}$ mm. and the width of the head 0.14mm.

Third instar: Width of head 0.21mm. Length of larva 1 $\frac{3}{4}$ mm. Head pale brown, body bright golden-yellow. The pairs of fleshy prolongations beneath the meso- and metathorax are distinctly visible, but there are no abdominal prolegs, although the segments on the venter of the abdomen are very well marked, and the rotundity of the first abdominal is less conspicuous than the others. (This segment has no prolegs in the fourth instar.) Some "Bacot's pile" occurs on the venter, and though something like tubercles were observed on the dorsum, no setæ could be discovered. Thus, though the development is comparatively slight, there is a distinct advance towards the active fourth stadium.

Fourth (last) instar: Width of head 0.3mm. Length of larva 3.8mm. Head pale yellowish-brown, with the lines and mouth-parts reddish. Prothorax and 10th abdominal segment very pale grey, the other segments yellow, very shining. When in the mine the alimentary canal is seen as a broad green stripe, but after the larva has left the mine, no trace of the green coloration is visible. The head is very broad and very flat, so that its dorsal and lateral aspects are very different. It can be almost entirely withdrawn into the prothorax. The spinneret is long, and the antennæ are conspicuous. There is a very deep notch behind. The prothorax is much wider than the head, and deeply divided into two subsegments. The mesothorax still wider, and also divided into two subsegments, but the division is not nearly so deep, the metathorax wider still, otherwise similar. The abdominal segments are fairly even in width, though

tapering down at the 8th. The 9th abdominal is much narrower, and the 10th very narrow. In profile the head appears as a thin wedge, and the prothorax is subtriangular. The mesothorax is heavily and rather squarely formed, and carries a pair of large prolegs, the metathorax being similar.

The 1st abdominal segment is of lighter make, and does not appear to carry prolegs, or if it does, the legs are very ill-developed compared with the rest. The 2nd-7th abdominals (both inclusive) are each furnished with prolegs, but the 10th abdominal has a rather slender pair. There are no prolegs on the prothorax, and if there were, I imagine, they would obstruct the larva when thrusting out the head and prothorax while feeding. When out of the mine and crawling, the larva of this species certainly makes use of the prolegs on the 10th abdominal segment, but the larvae of some Nepticulids hold the 10th abdominal quite free when crawling. *N. centifoliella* does so, and the prolegs of the 10th abdominal are much less developed than in *N. acetosae*. None of the prolegs bear crochets, but those on the thorax are each furnished beneath with a transverse row of three tubercles, each bearing a seta directed posteriorly; these six tubercles are in addition to the ordinary tubercles of the segment. The spiracles, situated on the usual segments, are small, circular, not raised. In the 10th abdominal segment two rods may be seen. They are 0.09mm. long, and lie close together at the end of the segment, but their anterior ends are wider apart than their posterior ends. They occur in all the four stadia. On the posterior surface of the 10th abdominal there is a pair of spines, and below these another pair of longer spines. In the larva of *Trifurcula immundella* the upper pair of spines forms part of a frame-work that runs round the posterior portion of the 10th abdominal. From the inner side of the frame-work a pair of flanges project, loosely connected with a pair of rods similar to those above described. The anterior ends of the rods appear to be attached to strong muscles. I have not seen this frame-work in the larva of *N. acetosae*, but strongly suspect that it is present. The tubercles are of moderate size, all simple, and the setæ all taper to a point. There are no secondary hairs, but many skin-points on the lower parts of the larva below tubercle iv. Tubercles v and vi are absent. In the abdominal segments the arrangement of the tubercles is as follows: i, the largest, is situated about the middle of the segment, taking it lengthwise, but at some distance from the median line, that is to say that the two i's are rather far apart; the seta of this tubercle is very stout, and 0.14mm. in length. Tubercle ii is slightly posterior to i, and rather low down; it carries also a stout seta 0.12mm. long. Tubercle iii is anterior to i, just above, and a little in front of the spiracle, it is very small, the seta being only 0.05mm. long. Below the spiracle, and rather posterior to it, iv is situated; this is rather large, and its strong seta is 0.1mm. in length. Below iv, and slightly posterior to it, is vii, just above the proleg; it is single, and the seta measures 0.08mm. On the inner side of the proleg, a very small tubercle, viii, lies, its seta is the shortest of all, being only 0.03mm. Looking at the prothorax from above, we see two pairs of tubercles, one on each side of the median line, a pair below each of these, and then a single one lower still. These are all on the first large subsegment. On the second subsegment there is a large tubercle with a

very stout seta in the subdorsal region, and a strong tubercle below. Beneath the prothorax there are, on each side of the median line, four tubercles arranged quadrilaterally. On the anterior portion of the mesothorax, there is a pair of tubercles on the dorsum, with a pair behind, followed by another pair; on each side below these, are two pairs of tubercles: beneath, there is a stout tubercle outside the proleg, and a smaller one on the inner side, with the row of three tubercles on the proleg between them. The metathorax is similar, except that on the dorsum there are only two pairs of tubercles, with three instead of four tubercles beneath them. The arrangement of the tubercles, as above described, agrees very well with that I have seen in *Nepticula cryptella*, and also in *Triturcula immundella*, but from what I have seen of other species of *Nepticula*, I think many of them would show a different arrangement.

PUPA: The total length of the pupa is about 1·6mm. It is rather stout and ochreous-yellow. The spiracles, which, in the larva, are very inconspicuous, are here large, and somewhat raised above the general surface. Most of the abdominal segments have a dorsal row of stout, brown-tipped spines, about twenty on the anterior of the segment, and the dorsum of the 10th abdominal carries two long spines directed upwards, that is at a right angle to the general line of the dorsum. These two spines must be very useful in anchoring the pupa to the silk inside the cocoon, when the pupa is thrust out sufficiently far for the emergence of the moth. I have seen one or two tubercles with setæ in the subdorsal region, but they do not seem to be present on all the segments.

EXPLANATION OF PLATE IX.

- Fig. 1.—Newly-laid ova of *Nepticula acetosae* $\times 20$.
- Fig. 2.—Larva in first instar $\times 30$, ventral aspect, showing thoracic ridges.
- Fig. 3.—Larva in second instar $\times 30$, dorsal view.
- Fig. 4.—Larva in third instar $\times 30$, ventral aspect, showing the ganglia, renal organs, and anal rods.
- Fig. 5.—Larva in fourth instar, after leaving mine $\times 20$, dorsal aspect.
- Fig. 6.—Outline of larva in fourth instar $\times 10$, lateral aspect.
- Fig. 7.—Cocoon $\times 3$.
- Fig. 8.—Pupa $\times 10$.
- Fig. 9.—Imago $\times 12$.
- Fig. 10.—Leaf of *Rumex acetosa*, containing four larval mines.
- Fig. 11.—Diagrammatic representation of third abdominal segment of larva in fourth instar, showing tubercles and setæ.
- Fig. 12.—Piece of skin of one of the abdominal segments, showing ventral prolegs, skin-points, and tubercles. [Note absence of tubercles v and vi.]
- Fig. 13.—Piece of skin of one of the abdominal segments, showing dorsum and lateral regions. The tubercles and setæ in figs. 11, 12, and 13, are drawn on an exaggerated scale.

Variation of *Aglais urticae*.

By GILBERT H. RAYNOR, M.A.

I am indebted to M. Lambillion, of Jambes, Belgium, for the information that he had already named two of the aberrations of *A. urticae* included in my paper on this species in *Ent. Rec.*, vol. xxi., p. 7. They are ab. *luteomarginata* (=my ab. *fulromarginata*), and ab. *bolandii* (=my *cneatiguttata*). His names supersede mine by virtue of their priority. Appended are the original descriptions—

ab. (et var.?) *luteomarginata*, Lmbl. (n. ab.)—Couleur fauve du dessus très claire; bordure marginale des quatre ailes d'un jaune pâle, et non d'un gris bleuâtre comme chez le type: taches bleues aux ailes supérieures presque effacées; tache blanche apicale fort développée. Dessous des supérieures d'un jaune pâle, sauf la base et les deux premières taches costales qui restent brunes; la troisième et l'apicale plus jaunes que brunes. Dessous des inférieures ayant la base brune comme chez *V. urticae*, mais avec le reste d'un jaune très pâle marbré de ferrugineux, sauf la bande subterminale qui est d'un noir bleuâtre. Obtenu d'éclosion, en juin, à Namur (Lambillion. *Revue mensuelle Namur.*, October 25th, 1906, p. 47).

ab. *bolandii* n. ab.—♂. Taille d'un exemplaire moyen d'*urticae*. Ailes supérieures ayant la teinte fondamentale typique, mais avec la bordure marginale très large, noire; points bleus ordinaires de cette même bordure très allongés, en forme de traits étroits, traversant tout l'espace noir et avançant même dans la partie fauve des ailes, surtout aux supérieures. Tache blanche apicale bien marquée, traversée par le premier trait bleu. Des trois taches discoïdales, il n'y a que celle de la base qui est assez grande, mais non éclairée de jaune extérieurement; les deux autres sont très petites, la supérieure à peine marquée. Ailes inférieures ne portant qu'une étroite bande fauve, ayant la forme d'un triangle très allongé, n'atteignant ni le bord supérieur ni l'angle anal. Dessous des ailes inférieures ne portant que de légères traces de jaune brunâtre; dessous des supérieures beaucoup plus noir que chez *urticae*.—Cette ab. comparée aux vingt variétés décrites, ne correspond à aucune d'elles. Cette forme nouvelle, très remarquable surtout par ses traits bleus et ses ailes inférieures, a été capturée à Spa, le 8 août 1907, par notre jeune et infatigable collègue, M. P. Boland, qui a déjà fait de si belles découvertes dans notre région des Hautes-Fagnes. C'est avec le plus vif plaisir que nous lui dédions cette belle aberration (L.-J. LAMBILLION. *Revue Mensuelle Namur.*, October 25th, 1907, p. 42).

The generic subdivision of the Lycaenid tribe Plebeiidi.

By J. W. TUTT, F.E.S.

Nearly three years ago, when our preparatory study of the generic synonymy of the Lycaenids was taking shape, a study necessitated by our contemplated revision of the group, in common with that of our few British species, we gave (*Ent. Rev.*, xviii., pp. 129 *et seq.*) a historical account of the generic names in the group, so far as was necessary for our purpose, and so that the student might find himself able to follow up our work, and the ordinary collector be not altogether out of touch with alterations of names that were sure otherwise to bother him.

Our studies of the Lampidids (with *Lamides boeticus*), of the Celastrinids (with *Celastrina argiolus*), and the Everids (with *Everes argiades* and *Cupido minimus*), have left the purely British collector exactly where he was, but the collector of Palæarctic butterflies has already learned that the supposed allies of *L. boeticus* (judged by Staudinger's *Catalog*), are quite outside the tribe *Lampididi* even, and distributed through several genera (*Nat. Hist. Brit. Lep.*, viii., p. 331), and that the Palæarctic Everids fall into several generic sections (although *argiades* remains the type of *Everes*), dealt with at length recently (*op. cit.*, x., pp. 41 *et seq.*). But these names, although essentially affecting the collector of Palæarctic, need not worry the collector of our few British, butterflies. We have now, however, in our revision, come to the study of the *Plebeiidi*, a very large group comprising the great mass of our small Palæarctic and Nearctic species of "blues." Some of the genera in this tribe have already become pretty generally known to, and used by, our

British collectors, but a few of our Palaeartic collectors, who should, in a matter of this kind, set the pace, having a greater amount of material to study and investigate, and hence a broader field for generalisation, want a little jogging occasionally, to keep them reasonably in the lines of accuracy, from which a little laxity often tempts frail human nature to stray.

Lycaena (with *arion*, *arcas*, etc.), *Scolitantides* (with *orion*, *baton*, etc.), *Glancopsyche* (with *cylarus*, *melanops*, etc.), fall quite outside the tribe *Plebeiidi*, being only somewhat distantly related thereto. As we have already noted, the various references to different species in this and other British entomological magazines, have made our readers conversant with the names of most of the Plebeiid genera which we propose using in our revision of the tribe, but, as we have to create certain others, we have here given a *résumé* of all the names we propose using, illustrated by reference to the British, and some of the better-known Palaeartic, species referable thereto, and shall be glad, for the sake of convenience in indexing, if those of our contributors who send notes on butterflies, will, if convenient to them, use the names in their articles. The Plebeiid genera referred to are—

PIEBEIUS—*Plebeius argus (aegon)* (type), *P. argyrogynomon*, *P. lycidas*, etc.

VACCINIINA—*Vacciniina optile* (type).

ARICIA—*Aricia astrarche* (type), *A. psylorita*, *A. idas*, *A. eumedon*, *A. donzelii*, etc.

CYANIRIS—*Cyaniris semiargus* (type), *C. persephatta*, etc.

POLYOMMATUS—*Polyommatus eros*, *P. icarus* (type), *P. amanda*, *P. escheri*, *P. hydas*, etc.

HIRSUTINA—*Hirsutina damon* (type), *H. dolus*, *H. admetus*, etc.

ALBULINA—*Albulina pheretes* (type), etc.

LATORINA—*Latorina orbitulus* (type), *L. pyrenaica*, etc.

AGRIADES—*Agriades meleager*, *A. cordion* (type), *A. thetis (bellargus)*, etc.

We have been largely helped in our determinations by Dr. Chapman and Mr. Bethune-Baker, although Dr. Chapman finds that, on the genitalic structures, *Hirsutina* is not separable from *Polyommatus*. It forms, however, such a distinct little lot of species that we retain the name, and hope to work out some definite differential data when we come to consider it in detail. This is merely intended now as a preliminary note to explain the names we have already determined to use, and which we are using, in the volume of *British Lepidoptera* now being published.

Contribution to the life-history of *Coenobia rufa* (with plate.)

By H. M. EDELSTEN, F.E.S.

Two or three years ago I was in the Norfolk Broads with Mr. Bowles, at the beginning of June, and not having very much to do during the day, we thought we would try and find larvae of *C. rufa*, about whose life-history very little appears to be known in Britain. As regards the continent, Wilde says "larva unknown," but he describes the pupa, and Hoffmann describes the larva, and says it feeds in *Juncus lamprocarpus*, so we went to a spot where there is an abundance of this rush, and where we had often taken *C. rufa* in numbers. We started by looking for sickly rushes, but there were so many stems of all colours, that it was like searching for a needle in a haystack, so we gave that up, and kneeling down in the fen we pulled

every stem within reach. At last, when we were nearly giving it up, I happened to pull a sickly-looking one, which come up quite easily, and, on examining the lower end, we saw at once something was feeding within. On cutting it open, we found a small, pinky-white larva of the Nonagriid type, and felt sure we had got the right thing. We set to work hard after this, going for all the unhealthy-looking stems, and managed to get about a dozen, some of which duly produced imagines. Since then several facts have been accumulated, of which the following appear to be among the most interesting.

OVUM : The ovum is about $\frac{1}{2}$ mm. in diameter, round, whitish, and quite devoid of markings, becoming darker before hatching, when the pinkish segments of the young larva can be seen through the shell. The eggs are laid in the centre of old rush stems, and the way they are placed there is most interesting. The ♀ possesses two sharp spines on the last segment (see pl. x), with which she makes a longitudinal slit in the stem; the spines are then forced apart, whilst the ovipositor is thrust between them into the pith, and the eggs are deposited in bunches of three to eight. The ovipositor and spines are then withdrawn, and the cut closes, and is hardly to be seen without a lens. The eggs were laid from July 20th to August 1st, and began to hatch about August 10th.

LARVA : When first hatched, about $3\frac{1}{2}$ mm. long; shining creamy-white; head, thoracic plate, and anal-plate, blackish-brown; meso- and metathoracic segments rather flattened, and pinky-white in colour, other segments rather raised and pinky-brown, giving the larva a rather banded appearance, the body having a few hairs arising from tubercles; true legs slightly dark at tip; ventral surface and legs whitish. The fullfed larva examined on June 3rd, 1908, measured about 16mm. long; head yellow-brown; prothorax and anal segments with straw-coloured, shining plate; colour of body pinkish-white, ventral surface dirty-white; head and body emitting some small whitish bristles; segments bearing also thirteen to fourteen small blackish tubercles. The thoracic segments are rather flattened, rest swollen, anal segment flattened, true legs yellowish, prolegs dirty-white, dorsal line whitish.

HABITS OF LARVA : The young larvæ remain in the old stems, making galleries in the pith towards the root, and keep more or less together. They appear to hibernate in these old stems, and early in the spring bite their way out, when each one enters a growing stem. The larvæ appear to feed in several stems. They bite an oval-shaped hole about a quarter of the way up the stem, and, entering, feed head downwards, ejecting frass through the hole; on reaching the root they eat their way out, and enter another stem. The infested stems quickly turn yellowish-green and wither. The ejected frass can be seen on the moss, etc., round the tufts of rushes, and a little searching reveals the infested stem. When about to pupate the larva enters an old stem low down just where the sheath ends, beneath the mossy surface of the fen, eats out a chamber, leaving a thin skin over its emergence hole, which is just on the fen surface, and pupates head upwards. They are fullfed from the end of May to the middle of June. The foodplant is *Juncus lamprocarpus*. Mr. Bankes believes it feeds in *Juncus effusus* in his district, and it may feed in some of the other *Juncus* species also.

PUPA : $11\frac{1}{2}$ mm. long, with a distinct "beak;" anal end of pupa

rounded, with dorsal surface ending in two sharp spines; colour light brown, segments slightly darker, also the ocellar area (beneath glazed eye).

HABITS OF IMAGO: The imago flies just before dark, and the flight is straight, and just above the herbage; they frequently settle, and if alarmed drop to the bottom of the fen and sham death. They fly very little after dark. The ♀ is very rarely met with, and seems to sit about on the rushes, and seldom flies.

HABITATS: The insect is very local, even in its favourite haunts, which are fens and rushy meadows, and it seems to keep to the rushy patches in the broads, and not to be all over the fen. Mr. Prout tells me he has taken the species in the Isle of Wight, where there is a small trickle of water down the cliff, with a few reeds and rushes growing in it, the whole spot being only a few feet square. It occurs throughout Britain towards the end of July.

PARASITES: The following parasites were bred from the larvæ: *Barichneumon lepidus*, *Aritranis carnifex*, and *Bracon fulripes*.

VARIATION: The perfect insect varies a good deal, and in addition to the forms mentioned in *Brit. Noct.*, vol. i., p. 48, viz., (1) the type, (2) ab. *lineola*, Stph., (3) ab. *pallescens*, Tutt; there is (4) an interesting reddish-brown form = ab. *fusca*, Bankes.

I am indebted to Mr. Main for the photograph.

EXPLANATION OF PLATE X.

Photo of body of *Coenobia rufa* ♀, showing the cutting spines.

The Lepidoptera of the Dischma-Thal.

By J. W. TUTT, F.E.S.

The morning of August 1st, 1908, broke wet and chilly at Davos, and it was not until after noon that a change for the better occurred; then the sun broke out somewhat fitfully, and a start was made for the Dischma-Thal. For a little while towards the end of the afternoon, the sun got more power, and a few butterflies were soon observed on the wing. First and foremost was *Erebia tyndarus*, which is very abundant throughout the valley, and then *Chrysophanus hippothoë*, a few specimens in good condition, but the greater part worn. The ♀'s appear to be of a dark race, with scarcely a trace of copper in the upperside colour. With these were *Lowcia subalpina*, a most interesting insect, very dark, and in rather better condition than *C. hippothoë*. Besides these, *Melampias melampus* were common, but *Erebia manto* was over, only a few worn ♀'s being observed. By the roadside a few ♀'s of *Pararge maera* were flying, and, on the nettles, were large numbers of larvæ of *Pyrameis atlanta* of all sizes and ages, and *Aglais urticae* from newly-hatched to pupæ, hanging on the stone walls. A mile or so up the valley the slopes began to take on more of the aspect of the alpine pastures, and less of that of cultivated meadows, and the herbage was less wet. Stepping up on these slopes, a fair number of species were disturbed, among which *Coenonympha iphis* and *Hesperia alveus* were most conspicuous, whilst *Argynnis aglaia*, *Brenthis amathusia*, were in fewer numbers, the latter apparently quite over. But the two species that were most abundant on the slopes were *Adkinia coprodactyla*, and *Crambus conchellus*; the former was in the

pink of condition, the ♂'s with their long slender bodies and much more uniformly-coloured pale grey wings, certainly more conspicuous on flight than the smaller, more variegated, ♀, which shows considerable variation in the development of the discal spots, the fissural spots, and the upper lobes of the forewings; they flew just above the level of the herbage when disturbed, and hung on the grass and flower-heads. *Crambus conchellus* flew somewhat high for a Crambid, with a very gentle flight, but very conspicuous, looking whiter on the wing than might reasonably be expected from its white-streaked golden forewings and grey hindwings. With the exception of *Eubolia mensuraria*, nothing else of interest appeared among the larger insects. Near some sheds, however, a mass of *Solidago virgaurea* was attractive, and a suspicion that *Fredericina calodactyla* (zetterstedtii) might be an inhabitant of the valley, led me to make a careful search. Beside, the *S. virgaurea* grew amongst a large bed of *Petasitis*, from which, at Mendel, I had disturbed some fine giant examples of *Platyptilia nemoralis*. The herbage being now nearly dry, I plunged into it up to my knees, and gently working forwards, soon had the pleasure of seeing a Platyptiliid in my net, a certain *Fredericina calodactyla*; but it was too early in the evening, or the insect was rare. I suspect the former, but a close and continuous search, in the manner in which British lepidopterists excel, only ended in fewer than half-a-dozen examples, enough to show that the species was there, and certainly past its best condition. This, perhaps, was not to be wondered at, as it was at least a month later than its time of appearance at Folkestone, although again it was at some 5500ft. greater altitude. At the same time I disturbed three examples of *Leioptilus tephradactyla*, one of which at least was quite exposed, sitting on a *Senecio* flower, and these were not at all in bad condition, but I kept them in confinement alive, fed them, and pampered them, and was able to get some notes on their habits for the next "plume" volume, if ever it should be finished. However, it was getting late and cold, and, as close work produced so little, a start back was made for Davos. Over the slopes *Nemeophila plantaginis* was racing in its well-known, break-neck fashion, a few *Merrifieldia tridactyla* were netted, and a few Tortricids, but this was all, except a solitary ♀ of *Brenthis pales* at rest on a flower-head. One of the ♀ *F. calodactyla* enclosed in a box laid three eggs, exceedingly small, of a full oval apparently in outline, much longer than broad, and not sunk in the top; under a hand lens the shell looks structureless, of a pale or yellowish colour, and both ends not equally rounded, but as a detailed description had already been published of the egg from British examples (*Nat. Hist. Brit. Lep.*, v., p. 167), I made no other notes at the time, although I sent them to England for further observation.

The next day, as has already been recorded (*anteā*, vol. xx., pp. 273 (*et seq.*), was spent on the high slopes between the Schatz Alp and the Strela Pass, and it was not until August 3rd that we again visited the Dischma-Thal. This time we plunged into the pinewood at its entrance, and wasted a considerable time. True there were large numbers of *Larentia caesiata*, and worn *Erebia ligea* and *E. euryale*, both with especially small spots, in many *E. euryale* reduced on the upperside of the forewings to mere black dots, although the specimens and bands were of normal size. A very fine ♀ *E. stygne* was the only one seen, and an abundance of *Brenthis amathusia*, *Argynnis aglaia*, some of the former

in not at all bad, and the latter in splendid condition, but not making up for the good things we thought the outskirts of the wood might possibly provide us; so we stepped out over the slopes to the road, finding the peasants, who were now busy shaving bare every available inch for hay, not at all adverse to our intrusion, and walking over plenty of *Erebia tyndarus*, on the whole rather small-spotted towards the apex, and *Cœnonymphia iphis*, some of the latter very cleanly marked on the underside of the forewings, with a broadish white band along the whole length of the outer margin, and with the usual metallic line quite absent = ab. *albomarginata*, n. ab., the apical spot on the underside of these wings also being absent. Here and there a specimen of *C. pamphilus* was disturbed, but the species was evidently rare. There were also a good many *Erebia manto*, but too worn to be of any service. Striking the path we soon passed our corner of the evening of the 1st, the bed of *Petasitis* badly showing where our heavy mountain-boots had trampled the plants, and we felt sad when we thought of the damage, but were somewhat mollified at the knowledge of the *Fredericina calodactyla* on our setting-boards, and the *Leioptilus tephraeactyla* that had hustled up and down the window that morning whilst we were setting, and had gone back happily into their boxes just before we had started. Lots of *Melampias melampus* were on the pathway, but we heeded them not. A steep gully soon came down to the path, its sides covered with wild flowers, and the latter with butterflies. We thought this could not possibly mean "hay" so up we went. Here we found a large number of interesting species, but almost all in such a condition as to warn us that the season in the valley for this year was practically over. Swarms of *Erebia euryale*, a few *E. manto*, plenty of *E. tyndarus* and *Melampias melampus*, the last two species in good condition, the first two worn, *Loreia subalpina*, and *Chrysophanus hippothoë*, whilst here, too, were the only two *Heodes virgaureae* seen in the valley, the ♀ of southern brightness, with a marked subterminal row of white spots on the hindwings, and, also interesting, some worn *Melitaea athalia*, and a single example of *Melitaea maturna* var. *wolfensbergeri*, the first specimen of the species we had ever seen alive. It sat fanning its wings on a flowerhead of *Petasitis*, and was recognised at a glance, although somewhat worn; of course it was an extremely late example, as this is a species one cannot really expect to see in August. Imagines of *Vanessa io* and *Aglaia urticae* were also sunning on the flowers, and an abundance of *Argynnis aglaja*, *A. niobe*, and *Brenthis amathusia*. Of moths, only *Melanchria montanata* was disturbed with *Eubolia bipunctaria*, and both species were still in good condition. Up to this time not a single "blue" butterfly of any kind had been observed in the valley, and a long tramp through the valley looked like producing none, until at last the cultivated portion of the valley was left behind, and, after crossing a bridge, we found a rough heathy slope that came down to the roadside; here a little runnel of water ran down by the side of the road for about 300 yards, and here, besides a number of *Hesperia alveus*, were a few specimens of *Polyommatus icarus*, *Plebeius argyrognomon*, *Aricia astrache*, *Latiorina orbitulus*, *Cyaniris semiargus*, *Vacciniina optilete*, *Albulina pheretes*, and *Agriades coridon*, drinking the water, only a few of each, all ♂s, and but one *A. coridon*, the only one seen in the valley. Another long stretch with little of entomological interest, and then a change in the

country gave a fresh impetus to the number of insects that were available, and the number of *Argynnis niobe* was most marked. Among other insects *Brenthis selene* occurred, always a most interesting species at this elevation; *Brenthis pales* now became very abundant, and, as the country opened out into the final stretch leading up to the Dürrboden with the Scaletta glacier in full view, a large white butterfly flapped down in front of us, and disclosed at once *Parnassius delius*, ♀, the first Parnassid seen in the valley. A couple of ♂'s were then successfully stalked as they came down from the slopes towards the grassy flats that borders the stream that here hustles down the valley at a rather slower pace than usual. The number of examples of *Pieris brassicae* observed in the valley throughout the day had been remarkable, and so large were they, that it was not often easy to discriminate between them and *P. delius* at a little distance. *P. rapae* was also abundant, but of *P. napi* only one worn ♀ was noticed. Here too *Colias palaeno* was fairly abundant, swinging along the slopes at tremendous pace. It was absolutely necessary to examine the species at close quarters, and, after some energy had been expended, perhaps half-a-dozen were captured, all remarkably small, but hopelessly worn and worthless. The afternoon was now drawing to a close, so slow had been our progress up the valley, and as there seemed little more to be done this day, we turned our faces towards Davos, hoping that, if ever good fortune settled that we should again visit the Dischma-Thal, we should do so at least three weeks earlier than on the present occasion. On the way down the valley we saw a specimen of *Argynnis aglaja* asleep, resting on the underside of a sallow leaf about $5\frac{1}{2}$ ft. from the ground, very similarly to one observed in the late afternoon of August 1st, which was resting near the same place on the underside of an alder-leaf about $4\frac{1}{2}$ ft. from the ground.

Larval habits of *Iphiclidess ajax*.

By CECIL FLOERSHEIM, B.A., F.E.S.

(1) *Resting-habit young*: The young larva of *Iphiclidess ajax* rests usually either on the underside of the leaves of *Asimina triloba* (papaw), or upon the dark grey stems of that plant with which its colour exactly harmonises. Whilst resting, its thoracic legs are not clasped; and it does not adopt the "sphinx-like attitude" so frequently presented by the young larva of *Papilio machaon*, but is outstretched. When undergoing ecdysis it rests also either on the underside of a leaf, or upon the stem of its foodplant.

(2) *Feeding-habit young*: On emergence from the ovum, the larva of *I. ajax* does not eat the empty egg-shell, contrary to what Scudder says (Butts. *New Engl.*, vol. ii., p. 1273), in fact I have been unable to discover that it does any more than make a passage for its proportionately very large head. It feeds as it rests on the underside of the leaves, and generally eats pieces more or less circular in shape, from the young leaves of *Asimina triloba*, the holes made being minute at first, but increasing with the growth of the larva. It feeds entirely during the day, and eats its cast skins. Sometimes the newly-hatched larva will feed on the upperside of the leaf, but it soon loses this habit entirely.

(3) *Resting-habit old*: On the underside of a leaf of *Asimina triloba*, rarely on the stem of the plant, and then only, as a rule, if of the dark

grey variety, which resemble in colour the wood. Indifferent (as when young also), whether head points towards tip or stem of leaf. Out-stretched position. Same attitude and position when undergoing ecdysis.

(4) *Feeding-habit old* : Still entirely on underside of leaf of *Asimina triloba*, but now holding on along midrib. Eats right across leaf, from tip towards stem, retreating as it feeds. Still regularly eats exuviae. Feeds entirely by day.

(5) *Food-habit* : I have never been able to get my *ajax* larvæ, of whatever brood, to feed on anything but papaw (*Asimina triloba*). *Asimina grandiflora*, however, I have been unable to procure. I tried them with our English kinds of *Vaccinium*, with *Tomato*, *Melon*, etc., but could not induce them to feed. Once or twice the imagines have laid ova, in the absence of *Asimina*, on *Aristolochia siphon*, but after one meal or so the larva perished.

(6) I have been able to discover no difference between the sleeping- and the resting-habits of *I. ajax* (larva). It keeps principally to the underside of the leaves of papaw, but occasionally sleeps on the stem of that plant.

(7) *Forward or laggard habit* : Of the two small broods of *I. ajax* larvæ which I had under observation, I noticed that some fed up sooner than others. All of them, however, in the instance of the first brood, produced imagines within a week of one another. In the case of the second brood only two larvæ pupated successfully, both of these doing so within three days of each other. One pupa gave birth to an imago in about three weeks, the other, in spite of attempts to force it, is hyberinating as such (cf. Edwards' account of *I. ajax*. *Butts.* of North America).

(8) *Movements* : After hatching, the larva of *I. ajax*, though onisciform, displayed great activity. Crawling about the stem and leaves of papaw rapidly, and letting itself down by a silken thread if disturbed or frightened. Unlike the larvæ of *Papilio machaon* and *Laertias phileenor*, it moves backwards when full-grown whilst feeding. When older it loses the habit of descending by means of a silken thread, but remains rapid in its movement till the end. It, however, will only display its activity if disturbed or in search of food.

(9) *Silk-spinning habit* : With the exception of the habit of letting itself down by a silken thread when recently hatched, the larva of *I. ajax* makes remarkably little use of silk, even when undergoing ecdysis. I suppose that this is due partly to its living always on the underside of the leaves or upon the stems of its foodplant or on the skin, partly to the fear of betraying its presence which evidently characterises it.

(10) Unlike the larvæ of *Papilio machaon* and *Laertias phileenor*, that of *I. ajax* conceals itself with assiduity all its life. When young it is not content with closely resembling a small grey slug, but hides itself usually either on the underside of the leaves, or upon the stems of its foodplant. This protective habit seems to grow with age (see the end of note 2).

When full grown its yellow-banded green-gray shape, swelling considerably towards the head, which resembles a blunt leaf-tip, and tapering to a stem-like tail, seen at right angles to the leaf upon which it feeds or rests, gives it the exact appearance of a bent or unfolding

young leaf of *Asimina triloba*, with the sunlight playing on its semi-transparency.

The larva of *I. ajax* is less inclined to use its osmaterium than those of *L. philenor* and *P. machaon*, rarely doing so if subjected to rough treatment when full-grown.

Edwards' account of the stench produced by the acrid secretions of this larva, is to my mind greatly exaggerated. To my nostrils, though stronger than that of *P. machaon*, it is no whit more disagreeable, yet he talks of "the stench being so strong as nearly to turn one's stomach" (quoted by Scudder Butts, *New Engl.*, vol. ii., p. 1273).

When short of food this larva exhibits cannibalistic tendencies, but not to any great extent. I only lost two larvae out of twenty in this way, though they were so short of food that several were unable to pupate successfully. Indeed, difficulty in procuring the foodplant which had to be sent from the middle of France, prevented me from going further into the life-history of this larva. With that of *I. podalirius*, I was totally unsuccessful, as I was unable to get the imagines to pair in the semi-captivity of my butterfly house. The full-grown larva of *Iphiclides ajax* varies considerably in colour, one or two, though kept in the same surroundings as the rest, being almost of a lamp-black in hue. As the cage they were kept in had zinc sides, it is possible that they were unusually photographically sensitive to their surroundings. (I think that this photographic sensitiveness of the larval skin must vary in individuals, for this year I noticed that one or two of my *P. machaon* pupæ were of the green variety, though in darker places and further removed from green leaves than some of the brown-black variety*.)

* They had pupated immediately below those on the same branch of the same Skimmia-bush.

List of Lepidoptera captured recently in Rossshire.

By DOROTHY J. JACKSON.

In the "preface" to the *Eutomologist's Record*, vol. xix, is a request by the Editor for contributions towards a list of the lepidopterous fauna of Rossshire and Sutherland. The list sent herewith comprises all the species that I have myself captured in Rossshire, many of which have, I believe, not been hitherto recorded for the county. By "Swordale" I include a radius of about eight miles in every direction, never more, but, in cases, in which I have found any species to be exceptionally local, I have mentioned the particular locality, such as "Kinraig, Invergorden," which is only eight miles distant. I have usually put the locality first, and then the date, and where "Swordale" is not mentioned, I have not found the species in the eight miles' radius. Conon Falls are about 20 miles away. I may add that most of the species have been identified by myself, but that those of which I had any doubt were submitted to Mr. Grimshaw of the Scottish Museum, before admission to the list. The following is a list of the species observed :

DIURNI.—*Pieris brassicae*, Swordale, common, June 30th, 1908, Stirkoke, Wick; larvae abundant on nasturtium, September 27th, 1907. *P. rapae*, not common, Swordale. *P. napi*, abundant, Swordale, April 25th, 1907; May 10th, 1908; July 24th, 1908. *Breutthis*

selene, Swordale, common, July 16th, 1907. *B. euphrasne*, Swordale, common, July 16th, 1907; May 31st, 1908. *Argynnis aglaja*, not very common, Swordale, July 25th, 1907; August 23rd, 1906; Falls of Conon, Strathpeffer, July 18th, 1908; Loch Maree, June, 1905. *Aglais urticae*, common, Swordale, May 10th, 1908; October 3rd, 1908; May 20th, 1908; July 6th, 1908. *Pyrameis cardui*, a few worn specimens seen at Swordale on May 9th, 1906. *P. atlanta*, not very common, Swordale, October 18th, 1908; Loch Achilty, Strathpeffer, very worn, October 9th, 1908; Stirkoke, Wick, October 12th, 1908. *Satyrus semele*, fairly common in low lying districts near the sea; Nigg, August 14th, 1906; August 26th, 1908; Nairn, July 27th, 1908. *Epinephele janira*, Swordale, common, July 4th, 1908. *Coenonympha tphon*, Swordale, common, frequenting the damper parts of the moor, July 3rd, 1908. *C. pamphilus*, Swordale, abundant, May 31st, 1908; Balmacara, West Ross, June 8th, 1905. *Callophrys rubi*, Swordale, common, especially fond of dry heaths with scattered pine-trees, and in such situations often exceedingly plentiful, but difficult to follow with the eyes, its colour closely assimilating with the brown and green shades of the heather, May 18th, 1906; May 8th, 1907; May 12th, 1908; Stromferry, West Ross, June, 1906. *Runicia phlaeas*, common, but rather local, Swordale, May 18th, 1908; June 6th, 1908; Nairn, July 29th, 1908. *Polyommatus icarus*, Swordale, common, June 20th, 1908; Nairn, July 27th, 1908. *Nisoniades tages*, very local, Swordale, June 8th, 1906; Falls of Conon, Strathpeffer, May 30th, 1908.

HETEROCERA.—*Amorpha populi*, fairly common, Swordale, July 13th, 1907: reared, May 10th, 1908; Stirkoke, Wick, two larvæ beaten from poplar, September 25th, 1907. *Anthrocera filipendulae*, cocoon found amongst heather on a small island close to Kyle of Loch Alsh, June 14th, 1907, emerged, June 25th, 1907. *Sarrothripus undulatus*, larvæ beaten from oak near Inverness, August 9th, 1907; another larva from oak near Beauly, July 4th, 1908. *Nola confusalis*, larva beaten from oak near Inverness, August 9th, 1907. *Nemeophila plantaginis*, common, July 16th, 1907; July 27th, 1907, Swordale. *Aretia caja*, larvæ sometimes common, Swordale, reared, July 13th, 1906; Tain larva, May 23rd, 1908, imago emerged, July 17th, 1908. *Phragmatobia fuliginosa* var. *borealis*, common, larvæ abundant, Swordale, imago reared, May 17th, 1908; Dornoch, larva, September 26th, 1906; Stirkoke, Wick, larva September 5th, 1908. *Spilosoma menthastrii*, Swordale, larva, common, September 1st, 1908; Nigg, larva, September 18th, 1908; Kyle of Loch Alsh, imago, resting very conspicuously on a black piece of ground where the heather had been recently burnt, on a small island close to the shore, June 14th, 1907. *Heptalus humuli*, Swordale, common, June 26th, 1908; larva, Wick, Stirkoke, September 10th, 1908. *H. velleda*, Swordale, common, June 25th, 1908; July 3rd, 1908. *Dasychira fasciata*, Swordale, fairly common, imago reared, July 8th, 1906. *Orgyia antiqua*, Swordale, common, full-fed larva found on heather, September 1st, 1905, pupated, September 5th 1905; imago emerged, October 1st, 1905; larva beaten from sallow, July 22nd, 1907; September 1st, 1907; Falls of Conon, Strathpeffer, beaten from birch, July 18th, 1908. *Poecilocampa populi*, Swordale, fairly common, larva, May 12th, 1907; Falls of Conon, larva, July 18th, 1908; larvæ collected in 1907 produced one imago

on November 3rd, 1907; but from three pupæ passing over the winter ♀s emerged on October 12th, 1908, October 17th, 1908, and October 30th, 1908. *Trichiura crataegi*, Swordale, three larvæ feeding on heather, July 20th, 1906; another larva on heather, June 15th, 1908; larva feeding on sallow, Loch Ussie, Strathpeffer, June 20th, 1908. *Macrothylacia rubi*, Swordale, common, ♀ reared June 10th, 1906; eggs laid on same day produced larvæ on July 17th, 1906. *Lasiocampa quercus*, Swordale, common, larva, June 3rd, 1907; July 15th, 1906; imago, reared, June 16th, 1908; June 25th, 1908. *Saturnia paronia*, Swordale, common, imago, reared, May 5th, 1907; Kyle of Loch Alsh, June 11th, 1905, larva; cocoon, Loch Maree, June 2nd, 1908; cocoon, Stirkoke, Wick, September 26th, 1907. *Drepana lacertinaria*, Swordale, common, larva beaten from birch, August 20th, 1906; July 23rd, 1907; Falls of Conon, July 18th, 1908, larva; Dornoch, larva beaten from birch, September 28th, 1906. *Drepana falcataria*, Swordale, not common, larva beaten from birch, September 9th, 1907; Falls of Conon, July 18th, 1908. *Dicranura furcula*, Swordale, fairly common, larva feeding on sallow, September 19th, 1906; August 30th, 1908. *Cerura vinula*, Swordale, common, larva, August 12th, 1908; Stirkoke, Wick, larvæ feeding on aspen, September 18th, 1908. *Pterostoma palpina*, Swordale, fairly common, imago beaten from poplar, July 9th, 1907; larva beaten from sallow, July 24th, 1908. *Lophopteryx camelina*, Swordale, fairly common, larva, August 31st, 1908; Stirkoke, Wick, larva beaten from alder, September 27th, 1907; September 11th, 1908. *Leiocampa dictaea*, Swordale, not common, larva beaten from poplar, September 1st, 1906; Dornoch, larva beaten from aspen, September 29th, 1907. *L. dictaeoides*, Swordale, fairly common, Conon Falls, Strathpeffer, larva beaten from birch, July 18th, 1908; Dornoch, larva, September 26th, 1906. *Notodonta dromedarius*, Swordale, common, larva, July 30th, 1906; Falls of Conon, Strathpeffer, September 18th, 1908, and October 3rd, 1908, larva; Dornoch, larva, September 26th, 1906; Stirkoke, Wick, larva, September 11th, 1908. *N. ziczac*, Swordale, common, larva, August 30th, 1908; Stirkoke, Wick, larva, September 11th, 1908. *Phalera bucephala*, Swordale, not common, larva, September 11th, 1906; Falls of Conon, larva, October 3rd, 1908. *Thyatira batis*, Swordale, fairly common, larva, August 12th, 1906; Inverness, imago, July 4th, 1907; Stirkoke, Wick, larvæ rather common, feeding on wild raspberry, September 6th, 1908. *Cymatophora or*, Swordale, common, imago reared, June 16th, 1908; Dornoch, larva, September 29th, 1907; Camster Burn, near Wick, larva beaten from aspen, September 7th, 1908. *C. duplaris*, Swordale, common, imago, July 9th, 1908; Dornoch, larva beaten from birch, September 27th, 1906. *Asphalia floricornis*, Swordale, common, larva, September 9th, 1907; Loch Maree, larva, June 2nd, 1908; Camster Burn, near Wick, larva, September 13th, 1908. *Demas coryli*, Swordale, common, Falls of Conon, larva, July 18th, 1908; Camster Burn, near Wick, several larvæ beaten from hazel, September 7th, 1908.

(To be continued).

NOTES ON COLLECTING, Etc.

FIRST APPEARANCES OF BUTTERFLIES NOTICED IN 1909.—On April 24th, I saw the first *Celastrina argiolus* of the year, a ♂ hovering over an elder-bush at the bottom of the garden here, in Lewisham. The earliest *Pieris rapae* were observed on April 9th, at Marychurch, *Aglais urticae* and *Vanessa io* the same day near Marychurch, the first *Pieris rapae* at Lewisham on April 19th, and the first *P. brassicae* the next day. Since then, many examples of both species have been seen.—A. M. COCHRANE, Lewisham. *April 26th, 1909.*

EGGS OF BOMBYX MORI WANTED FOR SCHOOL PURPOSES.—AN APPEAL TO THE GENEROUS.—May I ask if any of your contributors who may have eggs of the silkworm moth (*Bombyx mori*) to spare, will kindly forward a few for use in the Natural History lessons in this school?—E. G. PEASE, Portman Place Higher Grade School, Bethnal Green, N.E. *April 22nd, 1909.* [May we support Mr. Pease's appeal; and further, ask for a supply of larvæ of *Aglais urticae*, or those of any other common butterfly or moth, or any common water-beetles (living) during the season for school purposes, addressed either to Mr. Pease or Mr. Tutt, at the above school address?—ED.]

BIRDS AND INSECTS.—It may be well to place on record the fact that, on April 3rd, whilst in Epping Forest, I noticed a pair of Great Tits catching *Brephos parthenias*. They were particularly quick at catching them on the wing.—H. M. EDELSTEN, F.E.S., Forty Hill, Enfield. *May 5th, 1909.*

PIERIS MANNI IN VALAIS.—It may be of interest to record that I captured *Pieris manni* at Sierre, where I spent some days recently. I felt certain that the insect would be found in Valais, since I have already taken *rossii* at Martigny and at Branson, and Sierre seems a very suitable place for *P. manni*, being very warm, and its environs arid and rocky.—(Professor) J. L. REVERDIN, M.D., 43 Rue du Rhône, Geneva. *May 1st, 1909.*

SPRING LEPIDOPTERA IN THE JURA.—It was too early for many butterflies to be on the wing when we paid a short visit to the Jura in April. The weather had broken, after the delightful spell of bright sunshine we enjoyed at Easter, when we reached Lons-le-Saunier, the chief town of the department, on April 17th. On the following morning, during a walk in the park between the showers, I noticed *Tephrosia consonaria* on a tree-trunk, and a Pierid was flying which I was unable to get near enough to say whether it was *napi* or *rapae*, but on the 20th, at Morez, 737 mètres altitude, I captured the former species and saw the latter, and next day at the same place several *Gonepteryx rhamni*, all males, and *Aglais urticae* disported themselves in the sunshine. On the sallows I noticed a hibernated *Euranessa antiopa*, white-edged and ragged. The 21st was a bright spring day, and we drove to Les Russes, a fortified frontier post among the snow patches, at an altitude of 1,100 mètres, but at this height no butterflies were seen. On the 22nd, on the hills above Morez, the two "whites" already mentioned, *G. rhamni* (again all males), *E. antiopa*, *A. urticae*, and a male *Celastrina argiolus*, evidently just out, were captured. The only other species to be recorded is *Euchloë cardamines*, of which I saw and caught one male only at Les Planches-en-Montagne, altitude 725 mètres, on April 24th. After this date the weather again

became unsettled, and no more butterflies were noticed.—A. E. GIBBS, F.E.S., St. Albans. May 7th, 1909.

SCIENTIFIC NOTES AND OBSERVATIONS.

NOTES ON THE HABITS OF *LEPTIDIA SINAPIS*.—The following note in connection with the habits of this species may be of some interest. On September 5th, 1908, near Vernet-les-Bains, I was watching a ♀ *L. sinapis*, who was evidently searching for a plant on which to lay an egg. She flew low down amongst the herbage with the weak flappy flight peculiar to the species. Before long, she came upon an *Onobrychis* growing at the side of a rock, and after a short examination, settled upon it. At the same instant a passing ♂ *sinapis* saw her, and came fluttering slowly down. She was aware of his presence, for she flapped her wings sharply once or twice but took no further notice of him for the time being, and going on with the business in hand, curved her body to lay an egg on the underside of a leaflet. The male settled on the rock. As soon as the egg was laid she flew off, the male following. They settled together on a leaf and the male placed himself in front of her with his head towards hers. He uncurled his proboscis and with it struck her left antenna repeatedly, moving his head vigorously the while, and giving jerky flaps with his wings. He would strike her with his proboscis 6 or 8 times in succession, then remain perfectly still for 20 seconds with his proboscis curled, only to begin again. The female kept her wings upright and closed, but, at every stroking tap she received upon her antenna, she responded with a little flap. This went on with great regularity for nearly 5 minutes, the male never once attempting to pair. He then flew away, leaving the female at rest. I have not noticed the curious mode of courtship before, either in the case of Pierids or any other butterflies. The egg laid resembled in surface and colour that of *Pieris rapae*, but it was larger and tapered towards each end.—H. POWELL, F.E.S., 7. Rue Mireille, Hyères, France.

February 5th, 1909.

CURRENT NOTES.

The Carlisle Natural History Society has, for some time, had in hand a large number of papers relating to the local fauna and flora, that have been at various times read before the Society. The Society has now determined to publish these in *Transactions*, vol. i of which, is now in press, including one paper on Lepidoptera (by Mr. G. B. Routledge), and one on Coleoptera (by Mr. F. H. Day). The price will be 2s. 6d., and the secretaries ask for the support of naturalists by taking copies. Information from Mr. L. E. Hope, The Museum, Tullie House, Carlisle.

A most important paper (in English) "On the classification of the Dermaptera" has been published in the *Deutsch. Ent. Zeitschrift*, by Mr. M. Burr. The suggestions are put forward as tentative, and Mr. Burr asks for criticisms, observations, and suggestions. He divides the order up into—

Fam. 1. APACHYIDÆ

(Subfam. ANATÆLINÆ.

Fam. 2. PYGIDICRANIDÆ

DIPLATYINÆ.
KARSCHIELLINÆ.
PYGIDICRANINÆ.

Fam. 3. LABIDÆ.

	Subfam.	ALLOSTETHINÆ.
	"	ESPHALMENINÆ.
	"	BRACHYLABINÆ.
	"	PYRAGRINÆ.
	"	LABIDURINÆ.
	"	PSALINÆ.

Fam. 4. LABIDURIDÆ.

	Subfam.	AUCHENOMINÆ.
	"	CHELISOCHINÆ.
	"	CHELIDURINÆ.
	"	ANECHURINÆ.
	"	ANCISTROGASTRINÆ.
	"	FORFICULINÆ.
	"	OPISTHOCOSMIINÆ.

Fam. 5. FORFICULIDÆ.

This looks healthy. A classification in which the families and subfamilies are already capable of being definitely separated, suggests that the further study of the group will soon divulge the characters on which the genera can be grouped into their respective tribes within these subfamilies. No doubt Mr. Burr finds his visual grip of the groups ahead of his power to define the differences he sees in words, but this is so with everyone who is pushing ahead, and the power of definition comes with further study and greater knowledge, and one suspects that we shall soon have a fairly complete and rational classification of the Dermaptera on phylogenetic lines. In the meantime, Mr. Burr asks for criticism, destructive and constructive, especially the latter.

Dr. Wood, in his revision of *Phora*, adds more new species to the British list and to science; thus there are *Phora obscuripennis*, *P. conformis*, *P. humilis*, *P. alticolella*, *P. hortensis*, *P. nigripes*, *P. unguicularis*, *P. barbulata*, *P. beckeri*, *P. fungivora*, *P. albipennis*, *P. sordida*, *P. altifrons*, *P. pleuralis*, *P. diversa*, *P. variabilis*, *P. subpleuralis*, *P. frontalis*, *P. infraposita*, *P. rernalis*, *P. ciliipes*, *P. scutellaris*, all new to science, and *P. melanocephala*, v. Ros., and *P. lutea*, Mg., new to the British list, but already described.

A paper on "The cross-breeding of two races of *Acidalia virgularia*," with the statistical results obtained and tabulated, and the bearing of these results on the question of Mendelism, by Messrs. A. W. Bacot and L. B. Prout, has just been published in the *Proceedings of the Royal Society*, B., vol. 81, pp. 133-150. It is a most illuminating paper, but must be read by those interested to be properly appreciated. It is already a summary, and further summarising would not leave any clear mental picture of the results.

We have received from India, from our friend, Lt.-Col. Manders, a request that reads as follows: "In the last number of the *Trans. Ent. Soc. Lond.*, is a paper by Mr. Moulton 'On some of the principal Mimetic (Müllerian) combinations of Tropical American Butterflies,' and as an addendum to this paper, on p. 603, is a heading 'Certain Müllerian combinations among the *Danaiae* of the Old World,' illustrated by plate xxxiv. The figures are of three common Euploeaæ said to form a Müllerian combination. Would you please exhibit on my behalf, or your own, 'a combination of Pierines from the County of Middlesex,' *ciz.*, *Pieris brassicæ*, *P. rapæ*, and *P. napi*? If you should be asked at the meeting what evidence you have of tasting experiments

by young birds in England, you can reply—the same evidence that there is in other cases of Müllerian mimicry, that is, none whatever. I cannot help thinking that the adherents of this theory are carrying their ideas to the most unwarrantable lengths."

Most entomologists accept the general principles underlying the usual explanations of the theories of what are commonly known as simple instances of "Batesian," and even of "Müllerian," mimicry. When these theories were first propounded, explanations of the phenomena observed were offered by men who knew the habits of the mimics and their supposed models in nature, and who were in a position to state the details in favour of, and those against, the suggestions made in explanation.

During the last fifteen or twenty years the question of the explanation of assumed phases of Mimicry has been discussed by a host of men who have often never seen the supposed models or mimics alive, who know nothing of their habits, of their times of appearance, or even of the fact that they inhabit the same places at the same time, the most simple necessity for mimicry to be of the least effective value. In proportion to the ignorance of the authority of the exact locality, time of appearance, and habit of species supposed to be "mimickers" and "mimicked," has been the tendency for the said authority to enter into a wealth of detail with regard to the assumed origin of minor points of resemblance in various species, coupled with the manufacture of a peculiar terminological jargon which appears to have been created largely for the purpose of making ignorance appear to be knowledge.

The result has been that, at last, we have reached a point when the study of theoretic mimicry in its own particular language, has reached the status of a brilliant game of mental gymnastics, far in advance of chess, in which the names of insects are used as the pieces to move, the cloth on which the game is played having peculiar insects figured thereon, but from which game all reference to the habits of real insects is definitely excluded. Entomology is, as it were, called in as a sort of table-cloth on which the new philosophic, brainy, development, is to be played. A first-class game in this new philosophical, pseudo-entomology, was played at a recent meeting of the Entomological Society of London. The game (which was only one of a series) was opened by Mr. Guy Marshall, who had a sheet on which were drawn five figures of butterflies, three of which interest us. One of these had apparently a red splotch on its forewing, another had a blue splotch on its hindwing, the third one had both a red splotch on its forewing and a blue splotch on its hindwing. The red splotch and the blue splotch were, we understand, to be called aposemes, the butterfly with the two splotches had, therefore, a double aposeme.

Without going into the supposed details that had led up to this special form of coloration, we will merely note that one of the elements in the game, was to find out, if it so happened that three species of butterflies, one nasty to the taste with a red aposeme on its forewing, a second nasty to the taste with a blue aposeme on its hindwing, and a third nice to the taste with both a red aposeme on its forewing, and a blue aposeme on its hindwing, lived in the same place, what chances the butterfly with the two aposemes would have of escaping from two birds, one of whom had learned from tackling the butterfly with a red

aposeme, that butterflies with red on the forewings were nasty, and the other of whom had learned from tackling the butterfly with a blue aposeme, that butterflies with blue on the hindwings were nasty.

Mr. Marshall lectured with excellent humour and knowledge, and gained at once the sympathy of his listeners. He began by telling the Fellows that he had not the slightest knowledge that any such butterflies as those he had drawn existed; he did, however, show two butterflies that had certain aposemes, that lived in Peru, and a third butterfly which had in a crude way both aposemes, but "did not live within a thousand miles of Peru," but which, we understood, had been taken as the pieces in a previous game, to prove the effectiveness of the double aposeme to a species living 1000 miles from Peru, and supposed to warrant it against the attacks of birds that lived in Peru, and had learned the dangers and nastiness of the species with the single aposemes living in Peru, all of which struck us as very funny.

In answer to a question as to whether he had met, in his experience, in the tropics or elsewhere, any three species, living in the same place, at the same time, and with similar habits, one of which bore the possible relation of the double aposeme to the other two with single aposemes, he stated that he had not. He further stated that one of the reasons for his lecture, was that he wished to prove that even if it were granted that these things did happen, *i.e.* (such insects did occur together), in nature, then the chances of the success of the double aposeme would not be what it had been argued it would.

We were sorry that the President of the Entomological Society was not on the floor of the house to finish the game properly, but really it did not much matter. What we do want seriously to ask the Fellows of the Entomological Society, is whether these pseudo-entomological discussions could not be left to the brainy philosophers to fight out elsewhere, whilst the meeting-room was available for matters really pertaining to entomology, and entomological science. It is one of the greatest pleasures in life for an entomologist to hear a man's first-hand observations of species that he has watched in the field, mimics or otherwise, but it is surely high time we clarified our minds and distinguished fact from fiction, froth from fluid, entomology from entomological word-fights.

The South-Eastern Union of Scientific Societies holds its next Congress at Winchester, from June 9th-12th. The retiring President, Sir Archibald Geikie, K.C.B., F.R.S., etc., will open the congress, and the four days will be occupied with various matters of Scientific interest, particularly those relating to Hampshire. Particulars from Rev. R. Ashington Bullen, Englemoor, Heathside Road, Woking.

Dr. Chapman has discovered that the foodplant of *Latiorina orbitulus* is *Androsace (Gregoria) vitaliana*. Common as this species is in the high Alps, the detection of the foodplant has hitherto baffled all observers.

Mr. J. H. Watson describes how a consignment of the cocoons of *Attacus edwardsii*, recently sent him from Calcutta, was "opened by the postal authorities, the cocoons tipped out and tumbled back again anyhow, not packed as they were before, the lid pressed down tight, and so crushing the cocoons that only four out of twenty were unhurt.

and one entirely missing." His further account of how a box "of rare hybrid Saturniids was sent to the United States, carefully packed in a box with a glass lid, so that the contents could be seen, and provided with a label asking the customs' examiners to be careful with them, had the cord cut, the box opened, the cord and label placed inside among the moths, and the box then carefully tied up with string of their own," is pathetic in its exposure of official ignorance. Surely there must be, among the entomologists of Britain and the United States, someone sufficiently influential to attempt to stop such wanton destruction.

Both our contemporaries, *The Entomologist* and *Ent. Mo. Mag.*, record the exhibition at the meeting of the South London Ent. Soc., on February 25th, "several *Nisoniades tages* var. *taras*." This seems to be something new to the British list, or something new in the way of "skipper" mixtures.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

—March 11th, 1909.—EXHIBITS.—Mr. South exhibited a short series of *Acidalia degeneraria* received from Mr. J. Walker of Torquay, and pointed out that they were lighter in colour than the Portland form.

March 26th, 1909.—EXHIBITS: Mr. G. B. Brown exhibited specimens of *Eubolia bipunctaria* from Branscombe and Dawlish, which exhibited a reddish suffusion compared with specimens coming from Horsley. Mr. Tonge, an underside of *Triaena psi*, in which the central black spot was produced towards the base as a line. Mr. Bowman, a very pale ♀ of *Nyssia hispidaria* from Chingford, and Mr. Coote, ova of the same species, and a ♀ specimen of *Anisopteryx aescularia*. April 8th, 1909. EXHIBITS: Mr. Newman, a living ♀ of *Asteroscopicus nubeculosa* bred that morning after being four years in the pupal stage. Mr. Main, ova cases of a leaf insect from Ceylon, each containing one ovum. The species was parthogenetic, ♂s being rarely produced. Mr. Turner, a series of the delicate Pyrale, *Glyphodes sinuata*, from the Ja River, Cameroons.

ENTOMOLOGICAL SOCIETY OF LONDON.—March 17th, 1909.—GNANDROMORPHOUS EUCHLÖE.—Mr. G. Meade-Waldo exhibited a gynandromorphous example of *Euchlöe cardamines*, bred from a larva found at Hever, Kent. The wings on the right side showed the ♂ characters, on the left the ♀, the orange apical coloration showing faint traces on the latter as seen in *E. euphenoides* ♀. OVIPOSITION OF COENOBIA.—

Mr. H. M. Edelsten brought for exhibition a stereoscopic photo of the anal segments of *Coenobia rufa* ♀, showing the spines. These spines are driven into the dead stems of *Juncus lamprocarpus* making a longitudinal slit, they are then opened, and the ovipositor thrust into the pith and the ova deposited in small bunches. Ovipositor and spines are then withdrawn, and the cut, closing up, is hardly visible.

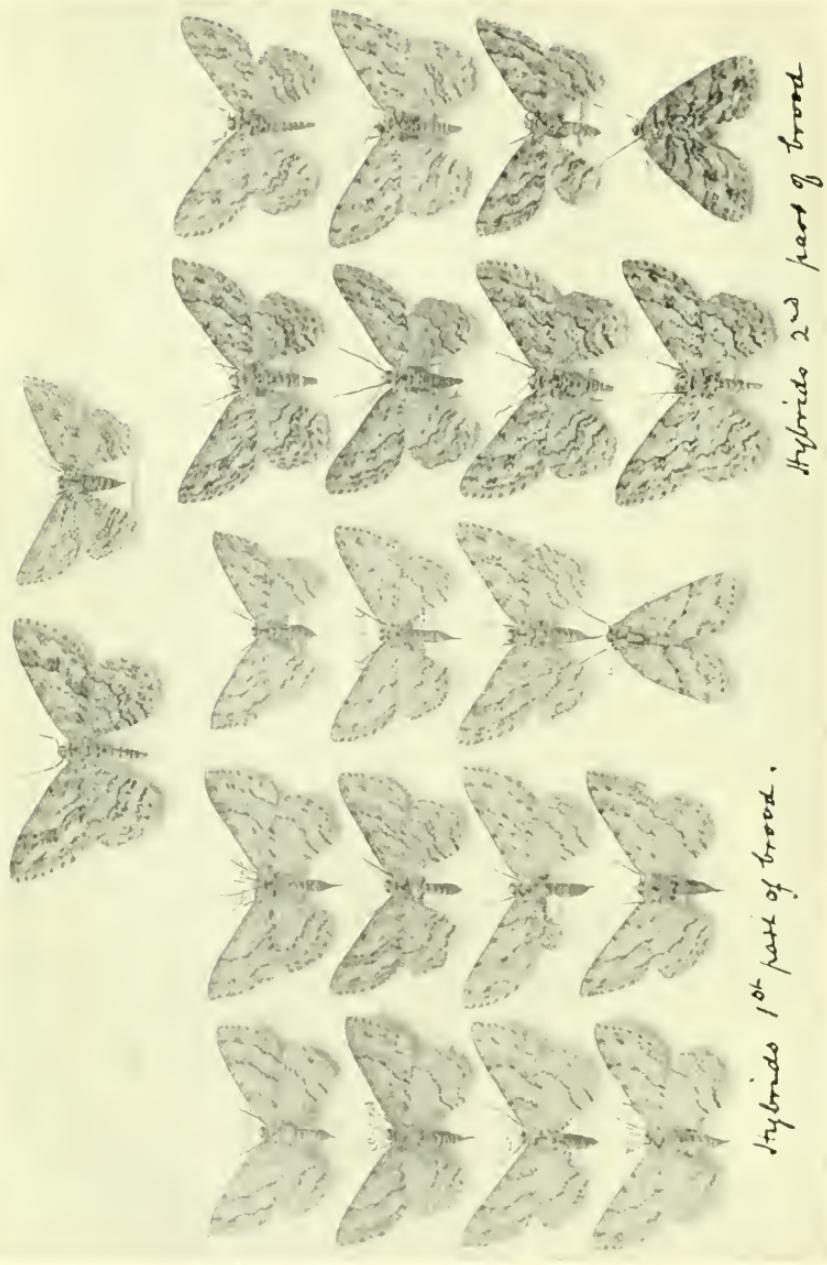
ABERRANT FORM OF CHRYSOPHANUS HIPPOTHOË, L.—Mr. W. Schmassman, a curiously marked ♀ of *Chrysophanus hippothoë* caught on July 22nd, 1908, at Göschenen. The black spots, forming the marginal row on the underside of the two forewings and one of the hindwings, were

elongated. The other hindwing and the wings on the upperside were normal. **MAMMOTH SCALE INSECT OF RHODESIA.**—Mr. C. O. Waterhouse sent for exhibition living ♂s and immature ♀s of the Mammoth Scale Insect which infests the M'sasa tree in Rhodesia. Also a dead example of the fully grown ♀ scale. These were recently received from Mr. J. Cameron of the Department of Agriculture, of Rhodesia. The ♂s were in abundance in white cocoons among dead leaves under the trees. They are what are known in collections under the generic name *Monophloeus*. The ♀ has been named *Lophococcus maximus* by Mr. Lounsbury. **COLEOPTERA AND HEMIPTERA NEW TO BRITAIN.**—Mr. E. A. Butler exhibited one species of Coleoptera, and five of Hemiptera recently added to the British fauna, viz., (a) *Myrmecopora brevipes*, Butl., from Tintagel, Cornwall, a species allied to *M. urida*, Er.; (b) *Cymus obliquus*, Horv., from Ashburnham, Sussex, in the Hastings' district, a species allied to *C. glandicolor*, Hahn.; (c) *Empoasca butleri*, Edw., and *E. populi*, Edw., the former from dwarf sallows on the sandhills of Carmarthenshire, and the latter from Lombardy poplars, Highgate; and (d) on behalf of Mr. Jas. Edwards, *Typhlocyba frustrator*, Edw., and *T. fratercula*, Edw. (together with a sketch of the appendages of the aedeagus in each case), both from Colesborne, Gloucestershire. These two species were described by Mr. Edwards in April 1908, but by an oversight they were omitted from the new catalogue of British Hemiptera which has recently been published. Mr. Butler also showed the unique example of *Myrmecocoris gracilis*, Sahlb., taken by him at Fleet, Hants, in August 1903. **POLYMORPHIC PAPILIOS AND STYX INFERNALIS.**—Dr. K. Jordan exhibited the polymorphic *Papilio lysithous* and *P. hestorides* from Brazil, and the models which they imitate. The exhibit illustrated a phenomenon observed in various groups of butterflies, viz., that a mimetic species may be broken up into a number of very different-looking individual varieties, which are all specifically the same, while the imitated models are specifically distinct from one another. He also exhibited both sexes of the peculiar Peruvian butterfly, *Styx infernalis*, described by Staudinger as a Pierid. Dr. Schatz made a mistake in describing the foretarsus of the ♂ as being fully developed. The distal segments of this tarsus are more or less completely fused, and the claws are absent. The insect is decidedly an Erycinid in the structure of the antenna, thorax, legs, neuration and the egg. **MIMETIC LOCUST.**—Dr. Jordan also showed, on behalf of the Hon. N. Charles Rothschild, an *Acrotylus* which the latter observed in some numbers in the desert on the Upper Nile. The colour of these small locusts so closely agrees with that of the sand and the pebbles (also exhibited) that, when settled, the insects disappear entirely from view. *April 7th, 1909.*—**OVA OF TAPINOSTOLA FULVA.**—Mr. H. M. Edelsten exhibited ova of *Tapinostola fulva* (*in situ*) laid within the curled leaf of *Carex paludosa*. Also a photograph of the anal segments of the ♀ showing the spinal appendages from the ventral side. These, when not in use, are carried flat, as in the photograph, but when the ♀ is going to lay, they are folded together and thrust between the curled edges of a leaf to force it apart; the fold makes a hollow in which the ova are deposited; and the leaf closes over the ova when the appendages are withdrawn.



Photo, E. A. Cockayne.

PERTHSHIRE FORM OF *TEPHROSEA BISTORTATA*.



HYBRID *TEPHROSIA HISTORTATA* \times *T. CREPUSCULARIA*.

(Two top figures = parents, ♂ *T. historta*, ♀ *T. crepuscularia*.)

Photo, E. A. Cockayne.

Notes on breeding *Tephrosia bistortata* and hybrid *T. bistortata* × *T. crepuscularia* (with two plates).

By E. A. COCKAYNE, F.E.S., F.L.S.

As a supplement to the interesting hybridisation experiments recorded by Mr. Tutt in the *Transactions of the Entomological Society of London*, 1898, the following notes may be of value. From a ♀ of *Tephrosia bistortata* (*crepuscularia*) obtained in Perthshire in April, 1907, I bred a small number of imagines in March and April, 1908, all of which had the deep chocolate lines and bold speckling typical of this race. Two of the *bistortata* paired, and a ♂ *bistortata*, a specimen with white ground colour, and not much suffused or speckled, paired with a small ♀ *crepuscularia* (*biundularia*), bred from Epping Forest ova. The ova from both pairings proved fertile, and a considerable number of the resulting larvæ pupated. The pupæ were kept in an unheated room.

The brood of pure *T. bistortata* emerged in two portions; nine, all ♀s, appeared between July 25th and 29th, 1908, and twelve, six ♂ and six ♀, between February 12th and March 23rd, 1909. The insects of both parts of the brood were large, and differed but little in colour and markings, none resembling the small white, feebly-marked, second-brood English *T. bistortata*.

The ♂s were much suffused with dark brown, though the colour was not as dark as in the finest wild Perthshire specimens.

The ♀s had the dark markings paler and less rich than is usual, and in some the ground colour was suffused with pale brown. All, but especially the summer specimens, look rather dull and faded.

The interest of this brood lies in the fact that *T. bistortata* is normally single-brooded in Perthshire, and that when a second brood is artificially produced, it resembles the first, and it is not totally different as in the English second brood.

The brood of hybrids also emerged in two portions, sixteen, all ♀s, between July 12th and September 25th, 1908, and ten, eight ♂s and two ♀s, between December 17th, 1908, and February 6th, 1909. The summer and autumn specimens were all small and pale, closely resembling the ♀ parent, while the winter and spring specimens were larger and darker. Though one ♂ is as dark as the ♀ parent, they resemble *T. crepuscularia* more than *T. bistortata*.

The wings look more pointed, and the elbowed line is more oblique, with but little dark shading outside it; the speckling is finer, and the whole appearance neater than that of Perthshire *T. bistortata*.

The ♀s, though small, are in colour and markings more like *T. crepuscularia* than *T. bistortata*. Owing to the long, drawn-out period of emergence, I was not able to attempt any further crossing between the hybrids *inter se*, or between a hybrid and a *T. bistortata*.

EXPLANATION OF PLATE XI.

Tephrosia bistortata from Perthshire ova, two sections—(1) emerged July, 1908; (2) emerged February–March, 1909. Third column captured specimens.

EXPLANATION OF PLATE XII.

Parents of crossing of *Tephrosia bistortata* × *Tephrosia crepuscularia*. Hybrid progeny of this crossing, two sections—(1) emerged July–September, 1908; (2) emerged December, 1908–February, 1909.

Random Notes on Lepidoptera, *Adkinia graphodactyla*, etc.

By PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N., F.L.S., F.E.S.

After what the papers described as the coldest July on record, we arrived in the neighbourhood of Wimborne, on August 6th, 1907, for the purpose of having a look for the larvæ of *Adkinia (Stenoptilia) graphodactyla*. For the first fortnight the weather, from an entomological point of view, was as bad as it could be—rain nearly every day, with high wind—and much of the boggy ground that one could walk over the previous year was more or less under water. About August 20th things began to mend, and, from that time up to September 12th, the day we left, it was bright and warm, and the ground rapidly dried up.

The first morning of our arrival I went to the locality where *A. graphodactyla* was discovered in 1906, but upon reaching the spot I found, to my dismay, that the ground had been swept by a fire, and the whole area was devoid of vegetation, or only vegetation of the scantiest growth, for I think from appearances, the fire must have occurred late in the autumn, or very early in the year now under notice. There was no sign of any marsh gentian, but, on going to another place where I knew it grew, and where there had been no fire, I noticed that the plants were only just appearing above the surface, and very few of the flower-buds were visible, and bog-aspodel, which was very nearly over by August 2nd last year, was only just coming into bloom. This was the result of the previous cold weather. It was rather a fine day, sun and cloud, with a strong wind, and everything was reeking wet after the heavy rain during the night. *Hipparchia semele* was numerous, but all the males I captured were worn, having been knocked about so by the everlasting wind. *Plebeius argus (aegon)* was just coming out, and in fine condition, but was not as numerous as it was in 1906, and this remark applies to a good many other species. *Hydrocampus nymphaealis*, *Crambus sylvellus*, and *C. warringtonellus* were common in boggy places, and *Pseudoterpna cytisaria*, *Gnophos obscurata*, and one *Lycophotia (Agrotis) strigula*, were disturbed from the heather as we walked through it.

The next day (August 8th) there was a little fine rain during the early morning, and after it ceased it remained densely overcast, with a moderate gale from the southwest, but in spite of this I went for a walk to a place where I remembered marsh gentian grew, and where I thought I should find it tolerably sheltered, and here, after a while, I came across a few plants which were growing among some rushes, and while examining them disturbed and captured two *A. graphodactyla*. These, of course, were of the first brood,* and this told me that it was probably too soon to look for larvæ. By this time the wind had become too strong for any more outdoor work, so I returned home. Upon examining the two moths I found they were male and female, and were very much worn. The latter on being pinned and placed on

* One is inclined to think that this species must be, on the facts here published, triple-brooded in this country. The first brood appears in June (see *Ent. Rec.*, xx., pp. 174-6) in Anhalt, and one suspects that we average quite as early as this part of Germany in southern England; the winter certainly being later in Germany. If that be so, the imagines met in mid-August would agree with specimens of the second brood that emerged with us the last week in July, 1906 (see *Nat. Hist. Brit. Lep.*, v., p. 535).—ED.

a piece of cork laid an egg, which hatched five days after, and the larva fed up rapidly with others I then had.

August 9th.—A thick drizzle all the morning, and a strong S.W. wind all day, far too strong to attempt any out-door work. In the evening, about dusk, while I was in my dressing-room, several moths flew in at the window, attracted by the light. The window faced east—so was on the sheltered side of the house—and overlooked a large, rough meadow, and there were heathy moors and fir plantations beyond. Just outside the window there was a large mountain-ash tree, which rather obscured the view. As everything out-of-doors was reeking wet after the rain, and the wind was still high, I thought I might just as well try and see what a light would produce, so about 9 o'clock I placed a small lamp upon a table just inside the window, and the result was rather astonishing, for moths came streaming in at once in scores, and for a couple of hours I was hard at it netting and boxing. Altogether I boxed forty-two species, but they were mostly common, the best being *Platypteryx hamula*, *Lycophotia strigula*, *Acidalia imitaria*, *Pachycnemia hippocastanaria*, *Hydroecia nictitans*, *Cerigo cytherea*, and *Crambus selasellus*—and the most numerous was *Malacosoma neustria*, which was a perfect nuisance, buzzing into my face, and getting into my boxes, when I was trying to box something else!

August 10th.—Finer than yesterday, but still a strong westerly wind. During the day I visited a large marshy meadow overgrown with sweet-gale, where I found a few *Peronea caledoniana*, *Tortrix viburniana*, *Bactra lanceolana*, etc., but the high wind carried most of them away as soon as they were beaten out of the bushes, so I had to give it up.

From 11th to 14th August there was a continuance of fine driving rain with high wind, and very little could be done in the way of collecting, so about this time I began searching for eggs of *A. graphodactyla*, and had very fair success; they were not at all difficult to find, for they are large for the size of the moth. I was induced to try this method on account of having picked a couple of stems of marsh gentian on the 12th, and upon examining the flower-buds with a pocket lens, discovered two ova (hatched) on the outside of the buds, about two-thirds from the base, and the next day I noticed two others that I had overlooked. I could see no signs of the larvæ, nor could I detect any holes eaten through the closed petals, but I was convinced that they were inside. This stem was placed in water, and in due course the four larvæ showed themselves. The parent moth does not seem to work by any fixed rule, for I found the eggs in all kinds of positions—on the flowers, both on the outside of the petals, and sometimes on the inside, when the flowers were open, on the calyx, leaves, flower stems, at various distances from the flowers—and very often the eggs were laid in pairs. It is a remarkably easy insect to rear. The flower-stems, with the eggs, were picked with good long stalks, and placed in a wide-mouthed bottle, with a little sphagnum between the stems, so that they should not be close together, and then a muslin hood was tied over—the stems keep for a long time, and when the larvæ had devoured most of the flowers and flower-buds, fresh stems were introduced.

August 15th.—With the exception of a couple of sharp showers in

the forenoon, to-day was bright and sunny, with a moderate breeze from the south-west, and during a ramble over the moors I came across a fresh locality for marsh gentian, and here discovered that the young larvæ of *A. graphodactyla* are in the habit of attacking the very small flowering-buds and shoots when not more than an inch, or a couple of inches, above the ground, and so to a certain extent retard the growth of the plants. Nearly every stem I examined had several empty egg-shells upon it, so the larvæ should have been abundant, but I did not see many, though every flower-bud showed traces of their presence. I gathered some of the flowering stems and placed them in a jar of water when I got home, and covered them with a muslin hood, and every one of them must have contained larvæ from the number that appeared in the course of a week or ten days. I saw two full-grown larvæ on the outside of one of the flowers, one dropped off the moment I touched it, and was lost in the sphagnum. I also saw one of the moths, but the wind blew it away, so I do not know whether it was a fresh or worn specimen.

Dusking, on the moors when the weather was favourable, produced a varied bag, but insects were not as numerous as they were the previous year. *Coenobia rufa (despecta)* was not uncommon in boggy places, but was getting worn by the 15th of the month, *Nudaria senex*, *Triphaena orbona (subsequa)* two only, *Nonagria fulva*, *Acidalia emutaria*, *Hyria auroraria*, *Schrankia turfosalis*, *Hypenodes costaestrigalis*, *Crambus sylrellus*, *C. warringtonellus*, *Hydrocampus nymphaeata*, etc., occurred in the same place, and on the drier part of the moors, *Pachycnemia hippocastanaria*, *Cidaria testata*, *Crambus hamellus*, and an occasional *Selidosema plumaria* were captured. *Peronea caledoniana*, *Bactra lancedana*, and *Tortrix riburniana* (a very different-looking insect from the one we get here on the coast) occurred among sweet-gale.

August 18th.—Walking back from church this evening a large beetle kept buzzing round my head, and upon knocking it down with my umbrella I found it was a fine specimen of *Prionus coriarius*, an insect I had never seen alive before.

August 20th.—A good many of my larvæ of *Adkinia graphodactyla* have attached themselves to the sides of the muslin hoods, and changed to pupæ.

August 24th and 27th.—Both days were bright and hot, and, on the 27th, some heavy clouds rose late in the afternoon, and there was a feeling of thunder in the air. About an hour before dusk I went to my favourite boggy place, and found moths flying in goodly numbers, and took some nice *Clepsis rusticana*, *Penthina marginana*, *Peronea caledoniana*, as well as a couple of worn *A. graphodactyla*, and some *Coenobia rufa (despecta)*, but soon after sunset the flight suddenly ceased, and a heavy dew rose. Before starting I had sugared the trees in the garden, but on going round on my return found every patch vacant.

August 31st.—This morning I went to the extensive boggy locality where I have taken and observed most of the larvæ of *A. graphodactyla*, and found that the recent hot weather had brought on the marsh gentian, and a great many more flowers were blooming than when I was on the same spot a week or ten days before. Upon examining some of the flowers, I was surprised to find dead larvæ in most of them; the larvæ were nearly full-grown, and they all had the same

appearance—not shrivelled up—but a dark blotch about the centre of the body, as if they had been stung by an ichneumon, or bitten by a spider. It was very curious, for at first sight they seemed to be all right, and were all in the same position, sitting head upwards in the flowers, and it was only by close inspection that I discovered anything was wrong. There must have been dozens in this state. Nothing of the kind occurred among my larvae in captivity, and so far, I have noticed nothing the matter with any of them; it seems a particularly easy species to manage. I took a worn specimen; the first brood appear to be a long time on the wing.

September 1st.—The first *A. graphodactyla* bred. Have been taking many insects at light lately, but nothing of any rarity; the males of *Heliothis popularis* the most numerous, but run very close by *Luperina testacea*, among which there are some very nice dark examples, and one *L. cespitis*.

September 6th.—The first fresh *A. graphodactyla* captured. Found two new localities to-day, where marsh gentian was growing plentifully, and most of the flowers had been more or less eaten, but I could not find any larvae or pupæ. The larvae must crawl down into the thick herbage to pupate, and some distance away from the foodplant, as I have never seen one on the plant.

September 9th.—*A. graphodactyla* are now emerging fast in my muslin hoods; seventeen appeared to-day; the greater proportion of the first bred are females.

Sugar was a complete failure during the whole period of our visit. I tried it night after night with the same result, nothing but a few *Phlogophora meticulosa*, *Triphaena pronuba*, *Noctua rubi*, *N. xanthographa*, and *Amphyipyra tragopoginis*. One night I nearly trod upon a hedgehog that was sitting at the foot of the sugared tree. I think he was lapping up some of the treacle that had run down the trunk.

Beating for larvae also proved very hot and unprofitable work; very few were obtained, and most of these were such common species as *Cabera pusaria*, *C. evanthe Maria*, *Dasychira pudibunda*, and *Lomasplilis marginata*; the best were *Acronicta leporina*, *Apotela aceris*, and *Dasychira fascelina*, but the latter, unfortunately, perished during hibernation.

Light was, perhaps, the most successful and interesting mode of capture in the way of numbers, though poor in the quality of the insects. On some nights they actually swarmed, and it was exciting work netting and boxing them, and the sport was varied one night by the appearance of a spotted fly-catcher, which flew in at the window about 10 p.m., and was promptly netted, but released after examination. On another occasion a bat kept following the moths into the room.

As previously mentioned, the first *Adkinia graphodactyla* was bred on September 1st, and the last on September 26th. I did not notice that any of the larvae or pupæ were attacked by ichneumons, or other parasites, for I found no dead larvae or pupæ, and all the pupæ seem to have emerged in a satisfactory manner; but on two or three occasions I observed small ichneumons, and I think a *Cynips*, in the muslin hoods, but do not know whether they were bred from the larvae or from the flowers.

The European species of the genus *Glancopsyche*.

By J. W. TUTT, F.E.S.

Some time ago, we showed (*Ent. Rec.*, xviii., p. 131) that the selection of *semiargus* (*aris*) as the type of the genus *Nomiades*, Hb., by Scudder, made the latter synonymous with *Cyaniris*, Dalm., which already had the same species for type. We also pointed out that *semiargus* was a Plebeiid species and only distantly related to *minimus* on the one hand, and *cyllarus* on the other, two species with which it had previously been assumed to be most closely allied although neither is a Plebeiid, *minimus* belonging to the tribe *Erevidi* and *cyllarus* to *Lycanidi*. In spite of this, and, perhaps, partly because *Nomiades* had come into such general use for *cyllarus* and *melanops*, but more because we knew of no other generic name rightly applicable to the latter, we have, in our work, continued to use it for the species, knowing at the time that the use was unjustifiable. Recently the question was raised in a note to us by Mr. Wheeler, and this urged us to look into the matter. A short search soon discovered that *Glancopsyche*, Scudder, "Sys. Rev.," p. 33 (1872), is the proper generic name for the *cyllarus* group. The type of this genus was fixed at the time that the genus was described by Scudder, as "*lygdonius*, Dbldy.," an evident misprint for *lygdamus*, Dbldy., "List Lep. Brit. Mus.," ii., p. 45 (1847) *nec* Dbldy., "Entom." (1841). This name has, owing to the inclusion of two separate species under it, had to give way to *couperi*, Grote. It appears that *couperi* is quite congeneric with our *cyllarus*, and that the latter will, therefore, come under the same generic title. [The specific synonymy of *couperi*, Grote, is detailed at length by Scudder, "Butts. New Engl.," ii., p. 953.] We should be glad if those European lepidopterists who send us communications will make the necessary alteration; a pencil note in their "Kane" or "Wheeler" will keep the matter straight when writing up their captures.

Callophrys avis—a new butterfly from Southern France.

By T. A. CHAPMAN, M.D.

Much resembles *Callophrys rubi*. *C. avis* is larger, 32mm. to 36mm. in expanse; *C. rubi* rarely exceeds 32mm. It has hardly any trace of tails. The upper surface has a ruddy tint, in excess usually of that of *C. rubi* var. *ferrida*, and the venation is often, especially veins three, four, and five of the upperwing in the ♂'s, marked by rather broad dark lines as if raised, differing from the narrower flatter lines seen in *C. rubi*. A marked character is that the head has a long ruddy fur, replacing all trace of the silver lines round the eyes so conspicuous in *C. rubi*. The androconial brand on the ♂ forewing is triangular, perhaps a shade broader than in *C. rubi*, but of only about half the length along the line of the veins, that it has in *C. rubi*, in which it is oval or fusiform. The club of the antenna is red or flesh-colour, all along the lower inner side, a colour confined in *C. rubi* to a few terminal joints of the club, and the same on all aspects of the antenna. There is rather a different shade of green on the underside, and the white line has quite a different character from that in *C. rubi*. It is narrow, but continuous; it is, in fact, usually broken by each vein, but looks continuous compared with *C. rubi*, in which the line

breaks up into spots, rather than become narrow as in *C. avis*. Either really, or as an effect of its narrowness, it has a suggestion of being faintly tinted green. It is entirely without the dark scales along its inner margin that are so constant in *C. rubi*. The portion in each interneural space is curved. It occupies all the spaces on each wing, from the costa to the space in front of vein two, but is bright towards the costa (space between six and seven), and fades towards the inner part of the wing. The row of spots in *C. rubi* is much more irregular. The first spot on the hindwing slopes inwards, in *C. rubi* it slopes outwards, giving the second spot the appearance of being displaced inwards in *C. rubi*, outwards in *C. avis*. The ♂ appendages have only slight differences. I have not examined sufficiently numerous specimens to be able to assert that these are constant.

It specialises in its foodplant, instead of being quasi-omnivorous like *C. rubi*.

Habitat, Southern France (Var, and Pyrénées-Orientales), Morocco (Tangier). The only specimen I have seen, not in my possession, is one in the Brit. Mus. Collection, ranged with *C. rubi* var. *ferrida*, and labelled "Tangier, Elwes Coll."

The Abraxas grossulariata at the recent Maddison Sale.

By G. T. PORRITT, F.L.S., F.E.S.

In the Rev. G. H. Raynor's notes under this heading in the current number of the *Ent. Record*, pp. 87-8, is one statement which I think calls for comment. Mr. Raynor tells us that the variety *lacticolor* is much more variable in itself than in the variety *varleyata*. No doubt the very limited (chiefly sale-room) experience Mr. Raynor has had with the latter accounts for the statement, for the fact is that exactly the reverse is the case. What a wide range of variation there is in var. *varleyata*, especially in the males, I thought I had clearly shown in my exhibit of some of the forms at the meeting of the Entomological Society of London on December 2nd last, and I think I may safely venture to assert that there is no series of *wild* var. *lacticolor* in existence that will show anything like the range of variation that does my series of *wild* *varleyata*. Of course we all know that Mr. Raynor, by selection of the parent moths for many years, has bred some very curious forms, but these come under the same category as do domestic pigeons and barn-door fowls; and, although no doubt very interesting as showing what can be done with the species (I am myself making two somewhat similar experiments with *Abraxas grossulariata* at the present time), are of comparatively little interest or value to the scientific lepidopterist. I am not disposed to discuss the monetary aspect of these things, that is a mere matter of sentiment, and, if any collector likes to give shillings or pounds for these manufactured aberrations, it is his own affair. Personally I prefer, and, if you like, consider far more valuable, recurrent varieties which are taken at large, or bred from wild larvæ, to those which are obtained by combination of crossings, but which could hardly by any possibility occur under natural conditions.

Why is *Cyaniris semiargus* no longer a British Insect?

By T. A. CHAPMAN, M.D.

There seems to be no evidence that *Cyaniris semiargus* still inhabits the British Islands. The causes of its extinction do not appear to be at all known, yet it seems very desirable that we should, if possible, ascertain something about it. Last summer (1908) I reared a few larvae from the egg, and the survivors are now (October) entering into hibernation. In noting their habits, I have been led to speculate as to whether they help us to get nearer some theory as to the extirpation of the species as a British insect, and I am tempted to state some of the ideas that have occurred to me, in the hope that they may be criticized so as to elucidate the subject a little further.

I may say, briefly, that the butterflies would hardly lay on *Lotus corniculatus*, which the larvae would, however, eat, but did so freely on heads of red clover (*Trifolium pratense*) on which the larvae seemed so much at home and with such straightforward procedure that I entertain no doubt that it is its favourite food. It eats less readily white clover (*Trifolium repens*) and could doubtless exist on other clovers and less closely allied *Leguminosae*. I take it therefore as fairly certain that red clover is the food-plant wherever it is available. The absence of the food-plant cannot then be the cause of the decay of the species with us. Yet, broadly speaking, I think agricultural reasons are at the root of the matter as in the case of *Chrysophanus dispar*, but certainly in some totally different manner. Climate can have nothing to do with it. *C. semiargus* does, no doubt, like a warmer summer than is necessary, e.g., to *Polyommatus icarus*, but it is capable of standing any amount of cold, occurring where the snow lies for several months. It was once sufficiently widely distributed in the southern part of Great Britain to show that it finds nothing inimical to it in our natural conditions, still our earliest information about it suggests that they did not fully meet its requirements. Some change, however, has occurred in the last 50 or 100 years that slowly made it rarer and finally extinct. The question of dates is no doubt important, and, unfortunately, I am rather ignorant of the changes in agriculture during this period, and especially of their exact dates.

My general idea, however, is that the butterfly would be inevitably attracted by clover-fields and would lay most of its eggs on cultivated clover; and, if for any reason eggs so laid never arrived at maturity, only those on wild clover would remain to continue the species, and these would very soon disappear by this migration of so large a proportion to the cultivated fields. The species would be unaffected in districts where wild clover was abundant and cultivated clover rare, provided the wild clover was not severely grazed or cut for hay. The larvae hatching in the flower-heads of the clover, just as flowering is going over, feed up in a few weeks, till about a quarter of an inch long and ready to hibernate. These larvae would perish if the clover was cut before the larvae reached this stage—and also if the clover was ploughed up during the winter, when the hibernating larvae would inevitably perish.

Probably the mowing machine completed the extinction of the species, by enabling the harvesting of the clover to be done more rapidly and ensuring that the whole field was cut before the larvae had

done the necessary amount of feeding, whereas under the scythe the process would often be more prolonged, and portions would remain long enough for the larvae to mature.

The mowing machine, however, appeared about 1850, and the disappearance of the species had then made much progress, so that we must look to the first half of the nineteenth century for the primary agencies.

I have tried to ascertain various dates as to the practical treatment of the red clover crop without much success; the introduction of red clover extensively as an arable crop goes back to the end of the eighteenth century, but with what rapidity it became general I do not know.

If someone versed in the history of English agriculture during the last 150 years would find precisely how clover was treated and to what extent it was cultivated in different parts of England from its introduction as an arable crop in the middle of the seventeenth century down to the extinction of *semiargus*, it would probably throw some light on the subject. The two leading points appear to be the great extension of tillage (including clover) about the beginning of the 19th century and the introduction of the mowing machine about the middle of that century.

On Reciprocal Mimicry.

Summary of Paper read before the Ent. Soc. of London, April 7th, 1909
(Extracted from Report).

At the meeting of the Entomological Society of London, on April 7th, 1909, Mr. G. A. K. Marshall read a paper with this title, and in the course of his remarks the author explained that the main difference between his views and those of Dr. Dixey as to the development of Müllerian resemblances might be stated as follows. The latter gentleman considers that within the limits of a Müllerian association every species exercises a mimetic influence upon every other, the amount of the influence depending upon its dominance, which is determined by its numbers, distastefulness, and general notoriety. Thus, as between any two species, the mimetic approach would be mutual, and result in an interchange of characters. This interchange would be proportionate to the relative dominance of the two species; where this is unequal, the weaker species would take on, to a considerable extent, the superficial appearance of the stronger, while the latter would adopt only some small characters from its mimic; but where the dominance is equal, the interchange would be equal, so that this would constitute the optimum condition for the production of "Reciprocal Mimicry." On the other hand, Mr. Marshall contended that this gravitational conception of mimicry was really based on a false analogy, and was at variance with the real principle of Müller's theory. While admitting the theoretical possibility of mimetic interchange, he urged that a logical application of Müller's argument would lead to the view that mimetic approach would be one-sided only, that is, from a weaker species towards a stronger and even in an opposite direction; further, that when the relative dominance of the two species was equal, the mere operation of Müller's factor would produce no mimetic effect, until some other factor had first produced a condition of inequality.

On this view mimetic interchange would never be mutual and simultaneous, but would only result from a complete reversal of the relative dominance of the two species during the production of the mimetic resemblance. For this process he had suggested the name of "Alternate Mimicry." The author was also compelled to reject entirely Dr. Dixey's new hypothesis as to the "function of the double aposema," because it completely left out of consideration the differences and resemblances between the various forms regarded from the standpoint of general facies; he contended that resemblance in general effect was of the first importance in considering mimetic relationship, and that this new hypothesis was liable to be extremely misleading on account of the exaggerated significance which it attached to the merely partial resemblance which might be said to exist between two species possessing a single conspicuous feature in common, but differing markedly in other respects. Moreover, not only was the theoretical position of "Reciprocal Mimicry" very unsatisfactory and unconvincing, but, further, the cases which had been cited as proving its actual occurrence in nature appeared open to serious criticism. For, while in some cases the facts did not appear to justify the assertion that an interchange had taken place, in the others such an interpretation involved many difficulties which disappeared when the mimetic phenomena were interpreted as being due to the simple mimicry of one form by another.

Mr. S. A. Neave said that as a result of his field experience in Africa, he was unable to accept the theory as to the function of "double aposemes," but he did not mean thereby to imply that he rejected every case of "Reciprocal Mimicry." He suggested that "Alternate Mimicry" might not be so uncommon a phenomenon as Mr. Marshall appeared to think.

Mr. J. W. Tutt asked whether Mr. Marshall really knew a single instance in which two species, supposed to carry different aposemes, lived in the same place with another species that showed the aposemes of these species, and occurred with them at the same time. In his exhibit Mr. Marshall showed two species with different aposemes occurring in Peru, together with the presumed species showing the double aposeme which he noted "did not occur within 1000 miles of Peru;" was there no instance known in nature which illustrated the point at issue, and so removed the question from the rank of mere theory? Mr. Marshall said that such a case was not known to him.

Butterflies in Switzerland in 1908.

By J. N. KEYNES, M.A., D.Sc., F.E.S., and G. L. KEYNES.

(Concluded from p. 102).

It is always interesting to work over this familiar ground, but we made few observations at Bérisal of special importance. The small bright form of *Lowelia (Chrysophanus) alciphron* var. *gordius* was to be found on the Ganter road, but it was scarce; *Plebeius zephyrus* var. *lycidas*, on the other hand, though somewhat scarce in its special locality above the Second Refuge, was to be found sparingly on both sides of this road from the Ganter bridge to below the Refuge, and it was for the most part in excellent condition. It is perhaps a fortunate thing for the welfare of the species that its range is apparently becoming less

restricted than formerly. This species was, as always, difficult to distinguish on the wing from *Polyommatus escheri*, which was fine and abundant. *P. hylas* was also particularly plentiful. *Parnassius mnemosyne* was still flying in the fields above the hotel, but was getting over. *Hesperia cocaliae* appeared to be specially common towards the head of the Steinenthal, as also was *Erebia erias*, though the latter was getting very worn. *Lycaena alcon*, on the other hand, was scarce in this locality. *E. ceto* occurred plentifully up to a certain elevation in the valley and was quite fresh; beyond this point it was replaced by *E. erias*.

On July 3rd, the younger of us climbed a steep gully on the east side of the Furgenbaumhorn, and was astonished at the great numbers of *Oeneis aëlio* and *Erebia gorge*, with which he met. It was not a convenient situation for catching butterflies, but among his captures were some remarkable forms of *O. aëlio* ♀, in which the ocellated spots on the upperside are doubled in size and number. The whole upperside of these specimens is also darker than usual, the pale fulvous portion being reduced to a definite antemarginal band.

On July 4th we moved on to Simplon Kulm, but the road from Bériscal onwards was singularly devoid of entomological interest. The fields at the top, however, were a mass of flowers, and here butterflies were flying more freely, those most in evidence being *Melitaea aurinia* var. *merope*, and *M. parthenie* var. *raria*. The former is certainly a brighter form than that which occurs in the Engadine, and of the latter we took an interesting series, one specimen having a broad black border in place of the usual series of linear divisions. The females varied considerably, the greenish tint of the upperside being much more conspicuous in some than in others. We also found *Hesperia cocaliae*, *Polyommatus orbitulus*, and *Brenthis pales* var. *isis*.

On July 5th we visited the moraine of the Kaltwasser Glacier, but the sun was unfortunately clouded over soon after we got there. We were able, however, to show that *Erebia alecto* var. *glacialis* was just coming out by securing two very fresh specimens. We were also very much interested to take an undoubted specimen of *Hesperia andromedae*: this was one of three or four small Hesperiids, which were seen buzzing together over a damp patch of bare earth, and looking more like flies than usual. We believe this to be a new locality for the species.

On July 6th we walked to the Seventh Refuge and back. On the way we took an early *Colias palaeno*, and a fine melanic form of *Brenthis euphrosyne*. We were surprised to find *Lycaena alcon* flying in quite large numbers over the marshy ground on the right side of the road as we descended. Its flight was heavy and languid, and it was consequently easy to catch; possibly this was owing to the comparative coldness of the day. We have previously only found this species one at a time, but on this occasion we might have taken twenty-five or thirty in ashort while. At the Seventh Refuge, *Oeneis aëlio*, *Erebia mnestra*, *E. epiphron*, and *E. erias* were plentiful, but we took only a single specimen of *E. christi*.

On July 7th we again visited the Kaltwasser moraine, but wind and cloud combined to make it too cold for any butterflies to be tempted out of their retreats.

July 8th, our last day, was spent very happily in the Laquinthal.

Erebia christi was very local and getting over, but by working over a certain steep slope it was possible to obtain a fair series, including one female. Amongst our other captures were *Pouellia* (*Pyrgus*) *sao*, *Cupido minimus* var. *alsoides*, *Pararge hiera*, and a very curious specimen of *Coenonympha arcania* var. *darwiniana*, in which the white band on the underside hindwing had completely disappeared. The males of *Erebia ceto* in this locality were, as a rule, much darker than those on the Ganter road, and approached the form var. *obscura*.

In conclusion, we should like strongly to recommend to entomologists and others the Hotel Fletschhorn, at Simplon Dorf.

Coccinella 10-punctata, L., ab. confluens, Haworth, at Darenth.

By HORACE DONISTHORPE, F.Z.S., F.E.S.

On May 16th, 1908, I beat, at Darenth Wood, a very distinct looking "lady-bird," which I have sent to Herr Weise for his opinion. He returned it to me as *C. confluens*, Haworth. It was described by Haworth, in "An Account of the Genus *Coccinellidae*" (*Trans. Ent. Soc. Lond.*, 1807, p. 278), as follows:—

" 13. 13-maculata, Haworth.

β. confluens, thoracis maculis septem confluentibus, maculisque tribus centralioribus elytrorum, valde confluentibus in maculam magnam lobatam puncta rubro relichto, earum medio; caetera ut in priore. Varietas rarissima et persingularis. Communicavit amicus Rev. T. Shrimshire, Entomologus assiduus."

It is a very beautiful insect and evidently a very uncommon form, as Mr. Waterhouse states that he has never seen one like it before.

VARIATION.

DESCRIPTION OF AN ABERRATION OF *Pyralis costalis*.—This very pretty little Pyrale is in some seasons excessively abundant in this neighbourhood, and I think there must be two or three broods during the summer, for it begins to appear in warm seasons, as early as the beginning of June, and can be found from thence to early October. It is very partial to old ricks, especially to those of clover hay, whence, in response to the beating-stick, it flies out in hundreds, but most of them do not go far, but seek a hiding-place in some other part of the rick. It is often accompanied by goodly numbers of *Pyralis glaucinalis*. It is also very fond of sugar, and I have seen as many as 40 or 50 on a single patch on an old pollard willow-tree. One autumn, some years ago—a *Colias edusa* and *Pyrameis cardui* year—I found a *P. cardui* sitting by the patch of sugar surrounded by a score or more of *Pyralis costalis*. *P. costalis*, as most collectors know, is very constant in its colour and markings, though it varies a good deal in size. Of the hundreds or thousands I have seen during the last twenty years, I have only met with one aberration, and of this only two specimens. It is a very distinct aberration, and I will describe it as ab. *rufescens*. The ground colour, instead of being rosy-grey, is replaced by deep red-brown, or madder-brown, faintly dusted with grey; the first line and costal blotch is almost obsolete, and, of the second or outer line, only the costal blotch is faintly visible, and in the centre of this is a minute white dot; the hindwings have no trace of either of the lines, and the fringes, instead of being of a bright clear yellow, are a dull orange-pink. It is altogether a very dark-looking insect compared with the type.—GERVASE F. MATTHEW, R.N., F.L.S., F.E.S., Lee House, Dovercourt. April 30th, 1909.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

EGGLAYING HABIT OF *POLYGONIA C-ALBUM*.—As there appears to be some uncertainty as to the position in which the egg of this butterfly is laid under natural conditions, it may be of interest to record that, of 37 eggs found on *Urtica dioica*, in Monmouthshire recently, by some friends and myself, all but two were placed on the upperside of the leaves, most of them being near or on the serrated edges at some distance from the stem of the plant. The two eggs found on the undersides of the leaves were close to the edge, and possibly when laid were placed on what was really the upper surface, owing to the curling of the leaves. In only one instance were two eggs found on one leaf, and these were rather more than $\frac{1}{8}$ " apart, one on the edge, and the other towards the centre, both being near the tip of the leaf. In two other instances two eggs were found on leaves growing on the same stem, but, in each case, there was one egg only on a leaf, and it appears probable that the usual habit of the species is to deposit its eggs singly.—A. L. RAYWARD, F.E.S., Croydon. *April 22nd, 1909.*

NOTES ON COLLECTING, Etc.

LEPIDOPTEROLOGICAL NOTES FROM PORTUGAL.—A friend of mine visiting south Portugal last March, was good enough to take a net and bring back a few butterflies. The following were taken at Mont Estoral, to the south-west of Lisbon, on March 20th. *Callophrys rubi*, one ♂ and two ♀s, all are var. *intermedia*, and one of the ♀s comes very close to var. *ferrula*, and is markedly iridescent; the ♂ is ab. *caecus*, the others are ab. *bipunctata*, the centre spot being very faint. *Papilio machaon*, *Pieris brassicae*, two ♂s one ♀, var. *charilea*, with underside hindwings very thickly powdered with dark scales. *Pieris rapae*, one ♂, approaching var. *manni*, Mayer. *Anthocharis belemia*, not uncommon, with silvery ground colour underside hindwing. *Colias edusa*, *Pararge megaera* and *P. egeria*. In addition to these, was a single ♂ *Fidonia plumistraria*.—A. S. TETLEY, M.A., 22, Avenue Road, Scarborough. *May 1st, 1909.*

DASYPOLIA TEMPLI AT SWANAGE.—It may be worth recording that I took a fine ♀ specimen of *D. templi* at sugar, on April 23rd, 1909. Is not this insect of rare occurrence in the south of England?—LEONARD TATELL, Karenza, Swanage, Dorset. *May 23rd, 1909.*

TIMES OF APPEARANCE OF *LIMENITIS CAMILLA* AND *L. SIBYLLA*.—Dr. Keynes' account of a visit to Eclépens, I read with the peculiar interest of one who has paid the locality a good deal of attention, but I was surprised at the statement that, while *Limenitis sibylla* was (as it always is) extraordinarily abundant, June 27th-29th, *L. camilla* "was only just beginning to appear." In my experience, *L. camilla* is always earlier by some days than *L. sibylla*. Is not the possible explanation rather that, at Eclépens, *L. camilla* is *very scarce*? I have only taken it at quite the bottom of the lower road. Only a few years ago it was supposed that it did not occur at all in the locality (vid. *Ent. Rec.*, vol. xix., p. 104).—FRANK E. LOWE, M.A., St. Stephen's Vicarage, Guernsey. *May 21st, 1909.*

LEPIDOPTERA IN MAY AT CUXTON.—GREAT ABUNDANCE OF GEOMETRID.

LARVÆ.—The large amount of sunshine that we have been fortunate enough to have had since April 13th, seems to have favourably affected plant and insect life to a much greater extent than the frequent cool (or even cold) nights have affected them adversely. Having heard of the abundance of ordinary spring butterflies, and witnessed in the London suburbs the large numbers of the two common Pierids, *Pieris brassicae* and *P. rapae*, the chance of an hour's ramble on the slopes of the chalkhills overlooking the Medway at Halling, on May 23rd, was too good to be missed, and, on as perfect a morning as could be desired, I found myself wandering through the woods on the summit of the crest of the hills that lie between Halling and Bush. There were lots of small fry already on the wing, *Nemophora schrariella*, *Adela viridella*, and other interesting species, whilst in the wood-clearings *Eupoecilia marnlosana* was abundant among the blue-bells, which were now in their prime. In the wood-riding the abundance of *Pieris napi* and *Euchloë cardamines* were noticeable, whilst, wherever the clearings opened towards the Medway slopes, an unexpected abundance of *Polyommatus icarus* ♂'s was noticeable, settling on the blue-bell flowers, in a manner known to be common in ♂'s of *Celastrina argiolus*, which also were not uncommon. On the pathways themselves *Nisoniades tages* was in great numbers, and in good condition, but only a single *Hesperia malrae*, whilst, from the bushes by the path-side, *Venilia maculata* came out in a way that I had not seen for many years. But the insect of the clearings was *Euchelia jacobaeae*, dozens of which flew up wherever the ragwort had got a hold in the year-old clearings. An occasional *Brenthis euphrosyne* flew in the same chosen haunts, but probably not more than a dozen were seen during the stroll. They were wonderfully tame though, sitting in the hot sun, and it was no great trouble to carefully pick them up with the fingers as they sat with the wings down horizontally on the ground, getting the full benefit of the exceptional heat. On the outside of the woods, a few examples of *Acidalia ornata* and *Botys pandalis* appeared to be very early, and with these were occasional examples of *Coremia ferrugata*. Strangely enough, among the many ♂ *Euchloë cardamines* seen, not a single ♀ was observed. *Callophrys rubi* was frequently observed on the leaves, heeling over to one side as if it were to allow the sun to strike its full force on the green of the underside, which in this position appeared to be the acme of a heat-absorbent valuable to the insect. In a warm sunny corner a ♀ *Celastrina argiolus* was observed apparently busy egg-laying on *Rhamnus frangula*, and another on *Euonymus europaeus*. We watched the former for a long time, but its resting-places were quite out of reach, and impossible of examination. In all the clearings and on the downs *Anaitis plagiata* swarmed, whilst, on the edges of a clover-field, *Coenonympha pamphilus* was very abundant, as also was *Polyommatus icarus*. Only a single *Aricia astrache* was noticed. Almost all the plants of *Arctium lappa* were attacked by larvæ of *Porrertia galactodactyla*, the larvæ mostly full-fed, indeed, some had already left the younger leaves, and had taken up a position on the undersides of the older leaves, either against the midrib or one of the larger branches for pupation, some have, indeed, already pupated. But the real purpose of this note was to record the immense abundance of larvæ on the trees everywhere; no doubt mostly of common species, but in countless

myriads. In the wood some distance beyond the keeper's cottage, a path about six or seven feet in width is pretty thickly closed in on either side, with an undergrowth of hornbeam, but with some birch and oak. Most of the large trees set back from the path, and overshadowing it in some places, are oak. This path, for about 400 yards or more, and on the side facing south-west, presented a sight that I have rarely seen equalled, never excelled. From the ground to some seven or eight feet in height, the bushes on this side were completely enveloped in thick white silken web spun by larvae that had let themselves down from every leaf and twig, and got entangled in the web spread below, struggling, falling, spinning silk all the time, and finally, perhaps, getting up again. There were some Tortricid larvae, but most were larvae of Geometrids, and so far as I could distinguish, nearly all were *Cheimatobia brumata* and *Hybernia defoliaria*. There were thousands enveloped in the web, but there were many square yards of thick web in which were no larvae, the spinners having apparently reascended temporarily to a place of safety. Many of the bushes were leafless, as if scorched by a blast, but in reality stripped of every vestige of green; others were in a transition stage, the growth made being so exceedingly rapid, that at present they afforded sufficient food for the armies resting on them, but no doubt a few days will suffice to leave them bare. It was a remarkable sight, and one worth being recorded. No doubt similar sights have fallen under the observation of other entomologists in other districts. We shall be glad to hear if such is the case.—J. W. TUTT, 119, Westcombe Hill, S.E. May 25th, 1909.

EARLY APPEARANCES OF LEPIDOPTERA.—A week ago (May 23rd) *Cupido minimus* was already out on the downs behind Southsea, *Agiades bellargus* is now (May 31st) out commonly, whilst *Aricia astrarche* is in perfect condition, and *Agiades syrianus* just coming out. I have already seen worn *Pararge megaera*, whilst one fine *Hesperia malrae* has been taken, only one other being seen. Among other examples an extremely pallid *Coenonympha pamphilus* was captured, and two beautiful female *Polyommatus icarus*, the latter species being very abundant.—A. SPERRING, 98, Orchard Road, Southsea. June 1st, 1909.

ABUNDANCE OF GEOMETRID LARVÆ.—It may not be too late, by the time this appears, to call attention to the remarkable abundance of Geometrid and Noctuid larvæ almost everywhere, and to suggest that collectors who do not do a few days' beating now, may regret it. During a walk, on May 30th, between Orpington and Chislehurst, the trees were in many places denuded, and, on a boundary stone, about $2\frac{1}{2}$ ft. high and 1 ft. square at base (from which one learnt that the parishes of Chislehurst, Orpington, St. Mary Cray and St. Paul Cray met at this point), situated under a large oak (with an undergrowth of holly), we counted, on one side of the stone alone, above 120 larvæ—Geometrids, Noctuids, Tortricids, and Tineids—of more than twenty different species, and the other sides were equally covered. There were thousands of pupating and starving larvæ on the ground, whilst the cracks in the oak-trunks were full of larvæ, hiding or spinning up; everywhere throughout the wood, on birch, hazel and oak, the larvæ were equally abundant, the numbers of those of *Hybernia aurantiaria* and *Cheimatobia boreata* being almost incredible. At any rate, a beating-tray in the wood through which the main road from Chislehurst to Orpington

passes would just now give a marvellous harvest, and no doubt a lantern after dark on a favourable night next autumn would show crowds of the two species named, with *Himera pennaria* and other species whose larvæ were recognised.—J. W. TUTT. June 1st, 1909.

CURRENT NOTES.

A few entomological friends foregathered at "Delamere," South Woodford, on the afternoon and evening of May 12th last, at the invitation of Mr. A. Harrison, and spent a most delightful time. Mrs. Harrison served tea at 6 p.m.; nearly a couple of hours were then expended in examining the results of the race-breeding experiments, which Mr. Harrison and Mr. Main have been conducting with *Pieris napi*, *Colias edusa*, *Aplecta nebulosa*, etc. Supper followed at 8 p.m., but it was 11.30 p.m. before Messrs. R. Adkin, G. T. Porritt, A. Sich, R. South, H. J. Turner, and J. W. Tutt, the London portion of the party, found themselves on Liverpool Street station, on the way home.

It is not often that an entomologist drops the study of his favourite hobby for considerably over a quarter of a century, and then, the serious business of life over, sets systematically about seeing the world in his leisure, and takes up entomology again as a complement to the mental enjoyment of seeing new places and things. Still more rarely is it that one is willing to make (even what must always, under the given conditions, be hurried) notes of what he sees, and to try, at least, on his return, to overcome the difficulty of finding names for the hundreds of butterflies observed, even during a trip in the sub-tropical parts of the Old and New Worlds, many of which have never been seen before, and possibly will never be seen again. To do this at all requires a great amount of pluck and determination. The attempt to get something scientifically useful out of observations made thus, deserves success, even if it cannot command it.

Thoughts of this kind at once came into our mind, when we received from Dr. G. B. Longstaff a separate copy of his paper "Bionomic notes on Butterflies," recently published in the *Trans. Ent. Soc. London*, and, although the opening words of the author, and one's knowledge of the difficulties under which the observations were made (difficulties not lessened, as the author points out, by the fact that he suffers from "the disadvantages inseparable from the loss of the sight of one eye, the other eye being both myopic and astigmatic, the astigmatism being only in small part capable of correction by optical means"), largely disarm criticism, a word or two may not be out of place.

The two points that strike one about the bulk of the observations made are (1) The humanity of the entomology. (2) The huge amount of uncertainty about most things recorded. One of the most difficult things in making scientific observations is to omit, as far as possible, the human element, *i.e.*, to view things from an external, and not an internal, standpoint. One may safely say that almost the whole of Dr. Longstaff's observations are made from the internal standpoint, and that, therefore, their value is lessened from the purely scientific point of view, in direct ratio as the observations are internal and not external. This is excellently illustrated by the conclusions on "scents." Assuming as practically proved that the scents of butterflies

are divisible into two classes (1) presumably attractive, (2) presumably repulsive or protective, he describes in detail the scents of a large number of insects as "agreeable" or the reverse, finding apparently, in our *human* appreciation of the scents, the necessary evidence that the scents really are "attractive" or "repulsive and hence protective," as the case may be. It is just here that the non-enthusiastic, but willing-to-believe-in-scent entomologist, comes in. He asks for the outside evidence that the humanly-agreeable scent is "attractive" and pleasant to the taste (!) of birds, reptiles, and other insects (which are, possibly, after all the greatest enemies of insects), and the other "repulsive" to them.

The record of the existence of the scents themselves is most useful, and the knowledge of their effect on the average human nostril valuable, but we do not find in the paper a single atom of outside evidence that the "scents that are agreeable to the average human perception are presumably attractive," nor that those that are similarly "disagreeable, or even disgusting to the average human perception, are necessarily repulsive and protective." Surely even the appreciation of scents by humans is largely the result of education, and estimated as agreeable or the reverse by different individuals, for the differing intensity of the same scent may produce pleasure or nausea in the same individual. Even the word "attractive," as here used, is open to objection, as, set in opposition with the word "repulsive," it suggests that its mere existence is as superlatively dangerous to the insect possessing it, as the existence of the "repulsive" scent is assumed to be superlatively useful to the insect possessing it. Surely "natural selection" would long since have attempted to get rid of so disastrous a feature as this "attractive" scent were this so; but, of course, no one really believes that it is, and our ignorance concerning these matters is colossal and still wanting almost entirely in observed facts in the field. In this, as in most things bearing on entomology, purely or largely of a speculative nature, it is so easy to believe what we want to believe, concerning things that are bound, by their nature, to be quite nebulous in our mental picture.

To read this paper, one might suppose that the details of the subject were "now so familiar," that it really was "not necessary to give the new evidence in great detail," and that there was no need for the observer to "concern himself with the special organs which are involved in elaborating or distributing the scents," when, as a matter of fact, it is very necessary to recognise fully how infinitesimal is our knowledge both of the nature of the scents, and the purpose or purposes they subserve; whilst, as to the biological origin of the scents, we are still in absolute Cimmerian darkness. The human outlook on entomology is so easy—true natural history so difficult. We do not wish to belittle the work done by Müller, Scudder, Packard, and more recently by Dixey, but after all what has been done is a mere scratch on the surface of a subject, the extent of which, and the difficulties of approaching which, we evidently fail to appreciate.

As to the purely speculative side of the observations, one illustration is as good as a dozen. One section is entitled, "Butterflies bearing the marks of foes." In this, 14 Neotropical butterflies are noted as having been captured with symmetrical, or nearly symmetrical, pieces out of the wings on either side; 21 others

in Ceylon, 2 in Algeria, and 1 in Hong Kong. Almost all these injuries are annotated "? by bird," "? by lizard," but we do not notice that Dr. Longstaff observed a single butterfly attacked by either bird or lizard. The "observations" here recorded, remind us of one made directly after Paris had been vacated by the Germans in 1871. In many of the deserted back streets, every house had the windows absolutely demolished. It was so evidently the result of the siege, that it came as a sort of a shock to discover, on instituting enquiries, that the damage was not done at all by the Germans, but by little boys who threw stones through the windows as soon as people were scared out of the houses. We hope that the "birds" and "lizards" are at least as possible as the "Germans."

We hope that we shall be forgiven for saying that, in our humble opinion, much more prominence should be given in future papers, to the doings of insects themselves, and that the human opinions of their actions should be reduced to as small proportions as possible.

It is with the greatest regret that we have to record the death of Professor Mark V. Sluigerland, of Cornell University, on March 10th last. His work necessitated him devoting particular attention to economic entomology, but systematic work found in him a careful and devoted student.

The last meeting of The Entomological Club was held at the rooms of the Savage Club, May 20th, 1909, when Mr. H. Rowland-Brown and Mr. A. H. Jones were the hosts. A strong muster of members and their friends took place, among others, Prof. E. B. Poulton, Messrs. R. Adkin, A. E. Gibbs, T. Hall, A. Harrison, G. T. Porritt, A. Sich, R. South, W. Sheldon, J. W. Tutt, J. J. Walker, etc. An excellent supper was served at 7.30, and afterwards, Professor Poulton, in suitable terms, proposed the toast of The Entomological Club, coupled with the name of one of the hosts, Mr. H. Rowland-Brown, who, as the promising last-elected member (or as he himself expressed it, the "baby") of the Club, vigorously replied. The unavoidable absence of Mr. G. Verrall and Mr. Donisthorpe, "beetling" in Scotland, prevented a full rally of the actual recognised full members.

The *Proceedings of the South London Entomological and Natural History Society*, for 1908-9, have just come to hand. It is an exceptionally good volume, with four most beautiful illustrations from photographs by Messrs. Tonge and Main. The Society appears in as flourishing a condition as ever, and there are the usual large number of interesting entomological items scattered through the pages. The Presidential Address, by Mr. A. Sich, is charmingly readable, exhibiting the president as a litterateur and artist of no mean capacity. The special papers by Dr. Fremlin, Mr. Sich, and Mr. A. H. Jones, will prove most interesting and informative to lepidopterists. A great measure of the success of the Society is no doubt to be ascribed to the energy of the permanent officers, of whom Messrs. Stanley Edwards, H. J. Turner, T. W. Hall, and W. West, must come in for a large share of praise.

One of the most important journals to lepidopterists, that is being published at the present time, is the *Bulletin de la Société lépidoptérologique de Genève*, edited by Professor C. Blachier. The fourth fascicule, completing vol. i., was published on May 20th, and completes

a volume of 394 pages, with twelve plates, several of which are beautifully coloured. The Presidential address for 1907-8, by Mr. A. Pictet, is most interesting. This well-known scientist was followed in the presidential chair for 1908-9 by Professor J. L. Reverdin, who is becoming almost as well-known to British lepidopterists as his colleague, Professor C. Blachier. Besides the reports of the meetings for 1908, there are several special papers—"Some forms of *Frebia tyndarus*," by Dr. J. L. Reverdin, "Contribution to the study of Palæarctic Sphingid hybrids," and "Catalogue of the Palæarctic Sphingid hybrids," both by Dr. Denso, "Life-history of *Macrothylacia rubi*," by Mr. Arnold Pictet, "The differentiation of *Satyrus herminiae*, *S. syriaca*, and *S. alcyone*," by Mr. J. Julien, "On the Glärnisch," by Mr. P. A. Muschamp, "Note on *Leptidia sinapis* ab. *erysimi*," by Mr. J. Culot, "New or little-known forms of Lepidoptera," by Mr. C. Lacreuze, "Aberrations of Lycaenids," by Dr. J. Reverdin, "New Aberrations of Palæarctic Lepidoptera," by Professor C. Blachier.

The two papers by Dr. Denso are particularly good, and must be referred to by all entomologists interested in the question of hybridity, and we must congratulate Dr. Denso not only on the subject-matter of these papers, but also in publishing the first of them in French, as it will no doubt find additional readers. There is, however, one thing to which we hope our Geneva friends will, with ourselves, take objection. It is to the use of new terms in place of others of prior and old-established claim, and we hope that they will, with us, insist on the necessity for keeping to the strict law of priority with regard to the terms "hybrid" and "mongrel," and to refuse to alter in new literature these old and well-established names. It is now more than 50 years ago since Darwin differentiated the crosses of two species as "hybrid," and the crossing of two races of the same species as "mongrel," and it is at least 38 years since Staudinger strictly defined a "variety" as a local race of a species, and an "aberration" as a chance variation, not racial. To speak of hybrids as "hybrid species," and mongrels as "hybrid subspecies," is as misleading as to call mongrels "varieties," neither having the legality of priority or custom behind it. Nor has the term "subspecies," in place of Staudinger's term "variety," any real standing. Uniformity of terminology can only be obtained as uniformity of names, by the application of the law of priority, and, after all, it is such a little matter (not interfering with the facts dealt with) to ask, that both Dr. Denso and Professor Standfuss should follow the usual zoological rules.

The way *Amorpha* hybr. *inversa* (= *populi* \times *ocellata*), Tutt, *Brit. Lep.*, iii., pp. 395-6 (1902), is treated, appears rather absurd. The name was definitely stated, in 1902, to apply to the cross of *populi* ♂ \times *ocellata* ♀, and everything known to date is published under this name. It is still the intention of the author that it should apply to this cross. Dr. Denso quotes all the records, from the *Nat. Hist. Brit. Lep.*, iii., pp. 395-6, even to the extracts from letters, in his synonymy, and then gives precedence to Standfuss' name *rothschildi* (1907). We can understand Dr. Denso's admiration for his chief at Zürich, but whilst *inversa* = *populi* ♂ \times *ocellata* ♀, we must claim priority for it by five years over Standfuss' name. Personal preference cannot over-ride priority. We trust the editor of the *Bulletin* to look into the matter as interesting entomologists outside Switzerland.

It was not till a few days before the sale that we heard that Mr. L. B. Prout's collection, other than the Geometrids, was to be brought to the hammer. It seemed a pity when one looked at the excellent condition of the collection as a whole, that the sale was not more widely known. Hundreds of specimens in beautiful condition, sold at less than a halfpenny apiece; a few things, on the contrary, attracted the owners of some of our best collections, and sold well. Among others, three aberrations of *Melitaea cinxia* produced £1 1s., £1 15s., and £1 5s. apiece; two fine *Ayriades coridon* var. *syrapha*, 22s.; a specimen of *Smerinthus hybr. hybridus*, 11s.; some nice Sesiids, including two *Egeria andreniformis*, 20s.; *Platypteryx sicula*, 24s and 20s. per pair, and 8s. for a ♀; *Cerura bicuspis*, 20s. for a pair, 7s. only for 2♂s; a pair of *Bryophila impar* sold for 3s.; whilst *Hyboma strigosa* fetched 12s. and 7s. for 4 and 5 respectively; *Leucania vitellina* went at 18s. and 11s. per pair, whilst *Leucania albipuncta* var. *grisea*, produced 17s. for 2, and 16s., 15s., 16s., 17s., respectively, for sets of 5; *Leucania favicolor* produced only 16s. for 5, and 12s. for 4 examples, whilst *Nonagria concolor* went for 18s. and 12s. in sets of 4; and a pair of *Nonagria edelsteini* (the new species from Sussex) produced 26s.: 4 *Luperina luteago* var. *ficklini* went for 12s.; 2 *L.* var. *barrettii* for 12s.; but a fine example of *L.* var. *barrettii*, and a bred *L.* var. *ficklini*, produced £2 2s.; *Xylomiges conspicillaris*, went in fives at 24s. and 22s., and in fours at 18s. and 16s.; *Petasia nubeculosa* sold twice over at 9s. for 3; *Cneulia gnaphalii* produced 14s., 12s., 10s. for 3, and 6s. for 2; whilst *Laphygma exigua* sold in sets of 7 at 16s., 18s., 11s., and 10s. per set; a Shetland *Crymodes exulis* went for 15s.; whilst *Aporophyla australis* var. *ingenua* ♂, went for 20s., 9s., and 5s., according to condition, and a fine ♀ for 26s.

Among the smaller things were three interesting lots. Lot 450, a bred ♂ *Bacotia sepum*, and six *Proutia betulina*, together with the larval cases; lot 451, the type of *Proutia eppingella*, as described in the *Natural History of British Lepidoptera*, ii., pp. 298, 569, together with larval cases of both sexes; lot 452, three ♂ *Proutia eppingella* with larval cases. Lord Walsingham visited the sale-rooms in order to add the first two of these to his collection, soon now to be handed over to the Nat. History Museum, whilst Mr. Bankes purchased the third. The prices given for the other lots of small things would hardly buy the pins on which the specimens were set.

At the Royal Academy Exhibition this year, is a picture that will charm all entomologists. It is called "The Aurelians," and depicts two well-known lepidopterists, Dr. G. B. Longstaff and Mr. Selwyn Image in a study, cabinet open, at work. The portraits are life-like, in that of Mr. Image, the artist, Mr. John Cooke, has excelled himself, for the kindness and gentleness of one of the most delightful personalities among the Fellows of the Ent. Society of London, positively speak from the canvas. Those who know Mr. Image feel that the artist *knows* him too. The artist has done full credit to Dr. Longstaff, but not quite in the same charming way. That he does not *know* the latter as he does the former, is evident. But it is nevertheless quite excellent.

Another far-different picture that will attract entomologists for quite a different reason is that by one of the Fellows of the Ent. Society of London, Mr. J. C. Dollman. There is nothing for us to

say, except that "Am I my brother's keeper?" keeps up the high standard of the intensely powerful series of pictures that has become so widely associated with Mr. Dollman's brilliant genius. The portrait of Miss Grace Dollman by Mr. Richard Jack, too, is quite one of the best portraits in the Exhibition.

There is always a great amount of pleasure in receiving the *Annual Report of the Entomological Society of Ontario*, the 39th of which we have just been looking through. There are many interesting things in the volume as usual, but year by year, one misses more and more, much of the pure science and literary flavour of past volumes. Year by year the study of entomology *per se* is becoming still more restricted in the number of its votaries; year by year entomology, as a branch of biological natural history, becomes yet more limited in its outlook, whilst a huge number of "professed entomologists" come into the entomological world as ready-made suns, bound to justify their existence (and salaries) by writing a little in a lot of words, concerning a few so-called injurious species, repeating the same facts again and again, usually in the crudest form, and in such a way as to get on the nerves even of pachydermatous people like ourselves; their remarks are illustrated by the same worn-out blocks by means of which their predecessors drove home the same thread-bare facts about the same insects, a quarter of a century ago, and one somehow wonders why.

The answer is, of course, ready at hand. The society receives about half its income as government grant, and is published by the Ontario Department of Agriculture, Toronto. It becomes, therefore, a sort of medium for the supply of information, on elementary entomological matters, to the many uneducated persons who require it from the Agricultural Bureau, and a good deal of this sort of material is printed. But among this are some of the old-fashioned notes by naturalists for naturalists. "The farmer's Wood lot," by the Rev. T. W. Fyles, makes one wonder whether certain notes bearing the same name in the old days of the *Ent. Wk. Intelligencer*, were the product of the same hand; Mr. Lyman gives "The life-history of *Euchaetias oregonensis*, Stretch"; "The Entomological Record for 1908," is by James Fletcher and Arthur Gibson; the last, alas, that will bear the impress of the Canadian master in entomological science. Mr. T. D. Jarvis' "Catalogue of the gall-insects of Ontario" is a most useful paper. Other papers worthy of attention are "Some Beetle Haunts," by Mr. F. J. A. Morris, and "Hydroecia micacea in Canada," by Mr. A. Gibson.

The volume unfortunately records the loss of one who, by common consent, has long since been regarded as Canada's premier entomologist, *viz.*, Dr. James Fletcher, who died on November 8th last. Born at Ash, in Kent, on March 28th, 1852, he was educated at the King's School, Rochester, was for some time employed in a bank in the City, and left for Canada in 1874, to fill the position of clerk in the Bank of British North America, which appointment he resigned to become assistant in the Library of Parliament at Ottawa. His spare time still, as ever, was devoted to botany and entomology, and this, in time, led to his appointment as honorary Dominion Entomologist and Botanist, and, in 1887, to his taking up the work of these departments at the newly-established Experimental Farm. Since then he has

worked continuously with Dr. Saunders, the director, and has well-earned the reputation of being one of the best scientific entomologists in Canada.

The various positions of honour that he has held, as President, Vice-president, Secretary, Member of Council of the Entomological Society of Ontario, of The Association of Economic Entomologists of North America, of the Royal Society of Canada, of the Entomological Society of America, etc., cannot be here enumerated in detail. Suffice it to say that he was President of the first and last at the time of his death, and that his decease has left a sad blank in the ranks of American entomologists. But to us in England, the fact that his first entomological work was done in Kent—in Chattenden Roughs, at Upnor, Cuxton, Cliffe, Bluebell Hill, and the neighbourhood of Chatham—is of the greatest interest. It was a revelation to the writer to find out, a few years ago, that the renowned Canadian entomologists knew quite as much of these charming spots as he did himself, that between 1871 and 1874, they were educating themselves in the same manner, in the lovely woods, on the breezy hills, and the dreary marshes, round Rochester and Strood, that glorious country that Dickens has written up in some of his works so accurately and delightfully.

Dr. Joy adds, on the strength apparently of a single specimen captured at "Great Salkeld, on April 11th, 1908, in carrion," *Homalium brevicolle*, Thoms., to the British list. It was named by Deville by comparison with "a Norwegian example of *H. brevicolle* in his collection."

Habits of Larvæ of *Laertias philenor*.

By CECIL FLOERSHEIM, B.A., F.E.S.

(1) *Resting-habit young* :—In small companies usually of ten to fifteen on underside of leaf of *Aristolochia*, ranged in files like bands of soldiers, with heads pointing indifferently inwards to stem or outwards to tip of leaf, rests sometimes with thoracic legs clasped and fore segments slightly arched (but not nearly so much as *Papilio machaon*), sometimes outstretched with thoracic legs touching undersurface of leaf (partial rest). Even when young the time taken for moult by this species, is longer than that of *P. machaon*, but as the larva grows it seems to take longer with each moult before it begins feeding again.

(2) On hatching the larva of *Laertias philenor* eats a portion but not all of the ovum—its habit in this respect being midway between that of *P. machaon* and *Iphiclides ajax* (the base of the ovum being left). It is not particular about devouring its exuviae when young (though it sometimes does so). It feeds on all occasions on the underside of the leaf and is gregarious; each batch of eggs splitting up as a rule into two companies of larvæ (*cf. anteà*). Whilst feeding, the larvæ touch one another so that if one of them moves it sets the others in motion by the imparted shock, and if one extrudes its osmaterium the rest follow suit. I have never observed it to feed at night at any stage of its existence.

(3) When two-thirds grown it is still gregarious, though less so than in its earlier stages, and rests usually, but not invariably, on the underside of the leaves. Its anterior segments are slightly raised and its thoracic legs not clasped together. When not at rest on the under-

side of a leaf it may be found resting at the end of a stem of a very young shoot of *Aristolochia*. A noticeable feature of the adult larva is its helplessness after exuviation, it remains flaccid for some hours, and does not begin to feed again almost at once as *P. machaon* does.

(4) When full-grown the larva of *L. philenor*, though still exceedingly sociable, is not strictly gregarious. Scudder (quoted *A Natural History British Butterflies*, i., p. 67) is wrong when he talks of the larvæ of the species concealing themselves for protective purposes "beneath the broad leaves of *Aristolochia*." *L. philenor* only keeps to the underside of the leaves when young or when about to undergo ecdisis; and the probable explanation of the fact that it does not feed usually, even when full-grown, upon the upperside of the leaves, is that, being exceedingly active, and except at times of exuviation, not accustomed to spin much silk, it is liable to fall off the uppersides of the *Aristolochia* leaves (cf. Scudder, *Butterflies of New England*, vol. ii., p. 1249). (I have not noticed it spinning zigzag lines of silk on surfaces of leaves, though I have often seen it fall off, even when undisturbed). Otherwise it is difficult to account for the habit of the full-grown larva of *L. philenor* to feed on the stems of the young growth of *Aristolochia siphon* rather than the leaves even when there is an abundance of the latter at hand, whilst fully exposed in companies of two and three, and its fondness for sunning itself, whilst not feeding, on the topmost stems of its food-plants or on their bare wooden supports, where it is a most conspicuous object. In addition to this I have often seen this larva when full-grown feeding on the upperside of the topmost leaves, often sufficiently flattened to afford it a foothold, with nothing between it and the sky above. A noticeable habit of the full-grown larva is that two or three will simultaneously devour a stem of *Aristolochia*, completely enveloping it, so that no green is to be seen, and feeding it down with their heads almost touching from several sides at the same time.

(5) *Food-habit*.—It seems to be confined to *Aristolochia*, the ♀s rarely ovipositing on plants of neighbouring families (Scudder, *op. cit.*, vol. ii., 124). Mine were all fed up upon *Aristolochia siphon*: but when this ran short they would eat, though not with the same avidity, the leaves and stems of *A. clematidis*.

(6) The larvæ, at all stages, sleep where they rest or stop feeding, and their sleeping-position is the same as their resting one.

(7) With regard to *Laertias philenor* throwing forwards or laggards in the larval state, I have been unable to segregate the many batches of larvæ sufficiently to have data for passing an opinion, but it is quite certain that some of the resulting pupæ have a tendency to produce imagines earlier than the bulk. It has been my habit each year to collect the pupæ of *L. philenor* as soon as they are hardened enough to detach, and to place them in a cool, thatched apple-house. Of these about ten per cent. will produce a partial second-brood as with *P. machaon* in the same circumstances, the number varying somewhat with the intensity of the early autumn sunshine, but the imagines do not always result from the pupæ first formed, though the last formed ones have a distinct tendency to go over the winter as such. Of this I am sure, as I place the pupæ collected at different times on different shelves.

(8) *Laertias philenor* in its larval state is exceedingly active after its middle stadium, and will often crawl a distance of two or three

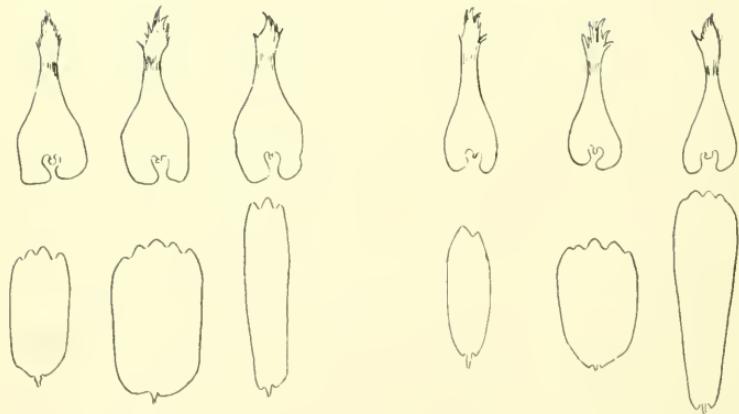
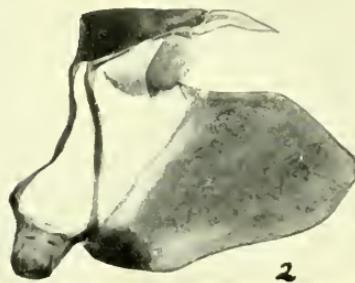
hundred yards in order to find a suitable place for pupation. Like *P. machaon*, but unlike *I. ajax*, it always moves forwards, and turns completely round rather than go backwards.

(9) *Laertias philenor* always spins a somewhat large quantity of silk at all stages of its life in order to afford itself a secure foothold when undergoing ecdysis, but I have not noticed it doing so at any other time.

(10) *Miscellaneous*.—The red brown immature larvæ of *L. philenor* massed together on the underside of its large leaves of *Aristolochia sipho* bear a somewhat striking resemblance to the brown blotches which form on the sun-burnt leaves, but rather later in life the larvæ seem to court exposure (*cf. anteà*). I have kept them in large quantities out-of-doors in a kitchen garden full of insectivorous birds, but have never seen either a larva or pupa attacked by one. Mice will eat the pupæ, but even in winter the birds refuse them. The ichneumon fly which infests *P. machaon* never stings *L. philenor*, and, out of all the pupæ which I have received from America, I have never found one containing *Troynus exesorius*, the pest of the Nearctic Papilionids. I have seen wasps hover round the half-grown larvæ but have never seen these attacked by them.

The imaginal habit of ovipositing in masses, unlike the other *Papilio*s with which I am acquainted, probably arises from this security from foes, and both the imago and larva are less easily frightened than those of other members of the family. The larvæ are exceedingly sociable in all stages, and it is no uncommon sight for one to find a batch composed of larvæ of various sizes, from one just hatched, to those two-thirds grown, feeding amicably together in ranks. It is a curious fact that, whilst the starving larva of this species will devour the newly-formed pupa, I have never seen it attack another larva even when quite small and defenceless. Being pharmacophagous it is probably attracted to the pupa by the latter's protective smell of *Aristolochia*, but, though its fellow larvæ must be equally impregnated with the juices of that plant, it evidently recognises them as kinsmen. When Scudder says that *L. philenor* is a slow feeder I do not think he is quite accurate, as this species is not only a more rapid eater but feeds for longer hours than *P. machaon*, it is one of the most voracious larvæ I have ever watched. Indeed, though the length of the time it spends in undergoing ecdysis, is far longer than *P. machaon*, it feeds up in the same surroundings in a rather shorter time.

After changing its skin the larva of *L. philenor*, particularly in its later stages, is unusually flaccid and helpless, and takes a longer time at least in our English summers, before it is fit to feed again, than either *P. machaon* or *P. asterias*. I can confirm Scudder's account of the peculiar habit that the adult larva of *L. philenor* (4th and 5th stages) has of drumming with its thoracic legs on leaves both when feeding or half-resting. I have also seen it do so on the backs of its companions, or even when suspended for pupation; but surely he is wrong when he says that *L. philenor* cannot extrude its osmaterium when changing skins (vol. ii., p. 1294). I have almost always succeeded in inducing it to do so, and it will do so even when it has been suspended for pupation for two days. I have found *L. philenor* larvæ use their osmateria readily in all stages. The quiescent time preceding pupation after suspension lasts, in fine weather, about two and a half to three days on an average.



rapae

3

manni

4

Photo. et Del. J. Jullien.

Ancillary appendages, Androconia and Normal Scales of ♂ *Pieris rapae* and *P. manni*.

Pieris rapae, L., and P. manni, Mayer (with plate).

By PROFESSOR J. REVERDIN, M.D., Memb. Lep. Soc. Gen.

The interesting articles by Messrs. Powell and Harrison, printed in the *Ent. Record*, have clearly demonstrated that these two Pierids differ in certain constant characteristics and that they should, therefore, be considered as distinct species, a conclusion already arrived at by Count E. Turati in his delightful study on *P. manni* and its variety, or rather summer form, *rossii*, Stefanelli. It seems to me that an anatomical study of certain organs confirming this conclusion should not be void of interest. I have, up till now, only examined the male genital organs and the androconial scales with the following results.

Male Genital Armature: In the first place I noted a slight difference in the size of the armature, that of *P. rapae* being rather larger than that of *P. manni*. The uncus is practically the same in the two species; immediately behind its base, attached to either side, stretches a slight ellipse-shaped membrane; this membrane is rather larger in *P. rapae* than in *P. manni*. The saccus of *P. manni* is more regularly formed and is shaped exactly like a thimble. The difference between the clasps is more considerable and was constant in every preparation that I made; it is easier to seize this difference by a glance at the accompanying plates than by reading my description. Whereas, in the case of *P. rapae* (pl. xiii., fig. 1), the outline of the clasp may be called a regular curve with its convex and concave parts united insensibly, the outline of that of *P. manni* (fig. 2) is, so to speak, harsher; the extremity of the clasp runs to a point and its upper surface presents an abrupt protuberance almost entirely absent in *P. rapae*.

The difference between the two armatures was striking enough to enable me to distinguish at a glance to which of the two butterflies the preparations I was examining belonged.

I have only been able to examine the armature of a single *rossii*, and found it absolutely identical with that of *manni*.

Androconial Scales: The distribution of the androconia seems to me the same in the two species; they are all situated on the upper surface of the wings and are in greater abundance on the fore- than on the hind-wings; the regions of the discoidal cell and of the apical spot seem particularly well provided with this class of scales. The scales were drawn by my colleague, Mr. Jullien, to whom I am also indebted for the photographs of my preparations. While the drawings show that these scales are nearly the same in the two species it may be noted that: (1) The androconial scales of *P. rapae* are larger than those of *P. manni*. (2) Their outline is more regular and symmetrical, drawn, so to say, with greater elegance in the case of *P. manni*.

These points of difference have been constant in every preparation I have made. The androconial scales are represented by the upper three of each figure. Below them are given the ordinary scales and a careful examination of the latter seems to point to a greater regularity in the case of *P. manni*: the curved outline leading to the pedicel is notably more symmetrical in *P. manni*, more irregular in *P. rapae*.

It is evident that the examination I have made ought to be repeated on a larger scale and that a study should be made of the internal, as

well as of the external organs. I venture to hope that some more competent person may be induced to undertake this task.

The conclusion to which my examination has led me is that the two insects, *P. rapae* and *P. manni*, are, though close neighbours, still abundantly distinct, *i.e.*, two species in the generally accepted sense of the word.

Collectors may be interested to hear that *P. manni* is not confined to Tuscany, the Riviera, the Oriental Pyrenees, Dalmatia and certain parts of Russia; we likewise possess it in Switzerland; my colleagues and I have netted it at Lancy, near Geneva, at Touges, on the lake of Geneva in the Haute-Savoie, near the Swiss frontier, at Crevin (foot of Mont Salève), and in the canton of Valais at Martigny and at Sierre; I took *P. var. rossii* in July, 1907, at Branson, and in 1908 at Martigny. It is, therefore, probable that this butterfly is much more widely spread than is commonly supposed. Mr. Muschamp tells me that he has also captured *rossii* in Geneva, in August, 1904, and July, 1905, and *P. manni* at Malaga and in Majorca.

EXPLANATION OF PLATE XIII.

1. Ancillary appendages of *Pieris rapae*. | The left clasp of the genital
2. Ancillary appendages of *Pieris manni*. | armature has been removed.
3. Androconia and ordinary scales of *Pieris rapae*.
4. Androconia and ordinary scales of *Pieris manni*.

Spring notes on the Lepidoptera of Mucking.

By Rev. C. R. N. BURROWS, F.E.S.

CELASTRINA ARGIOLOUS has been unusually abundant. I have noted it flying from April 15th to June 20th. I have been watching its rather erratic flight with interest, hoping to find out something more about its egg-laying habit, as a clue to possible unknown food-plants. Sweet Bay and *Euonymus europaeus* seemed to share the attractions with Portugal laurel (*Cerasus lusitanica*) and holly, but only upon the two latter plants have I found the eggs laid. Upon the Portugal laurel flower-spikes the eggs are laid in the usual manner, but generally upon the central shaft. The heavy rains drowned out the larvæ from the clusters of holly flowers, but has not incommoded those feeding openly upon the Portugal laurel, which have fed up rapidly and are now, June 21st, mostly fullfed. They bore into the buds, as the autumn larvæ do.

PHORODESMA SMARAGDARIA.—On May 13th I examined my bag of larvæ, which had been hybernating quite successfully upon "Old Man." I found one or two larvæ preparing to pupate. I removed the whole batch of larvæ to my large out-door cage, and supplied them with abundance of fresh food—*Artemisia absinthium* and Old Man. Now these larvæ when taken from the bag had not troubled to renew their clothing since waking up, and were covered with dead material, when covered at all. But no sooner were they exposed to the full light of day behind the glass door of the cage, than the whole number set to work at once and dressed themselves in fresh green.

SPILOSOAMA MENDICA.—A beautiful female bred out of doors, May 8th, was placed in a muslin cage and exposed in the garden. She lived until the 31st, and during the whole time scarcely moved an inch. No male appeared during sunshine, dusk, or dark. But on May 13th

I found a male in my study, having been doubtless called by the female, and, missing his way, flown in at the garden door the previous night. Placed with the female, he lived a few days, but appeared to be past moving, and the eggs laid appeared to be all infertile. These numbered 156 in all, but eventually 39 changed colour and 8 hatched, so that the moths must have paired after all. The species must be, however, as I have always thought, very rare here.

ANTS AND LARVÆ.—My out-door cage is probably quite ichneumon-proof, and all the sides but the one glass door are protected by a double-muslin cover, the width of the wood frame, half-inch, separating the covering. But it is not free from the incursions of the ubiquitous ant. I have not found this insect do any harm, unless it be by disturbing the pupating larvæ. I have, however, seen ants leading off small spiders, earwigs, and such-like vermin, introduced with the food. Their chief business, however, seems to be carrying away unripe violet seeds, exposed by the jaws of *Arctia caja* larvæ. I have not measured the full length of the journey necessary for the safe garnering of these seeds, but it must be quite 6-8 feet of precipitous descent.

INTERESTING FOODPLANTS.—In my cage I feed a mixed family; I notice that the larvæ get confused amongst the variety of foods. *Pericallia syringaria* has been eating violet, plum, and "Old Man"; *Arctia caja*, lilac, "Old Man," *Sedum*, and nettle; *Orgyia gonostigma*, violet *Spiraea*, and *Sedum*; *Lasiocampa quercus*, lilac, etc.

Note on the distinguishing characters of *Anthocharis tagis*, Hb., var. *bellezina*, BdV., and *A. belia*, Cram.

By GEORGE WHEELER, M.A., F.E.S.

Some three or four years ago my attention was called by Mr. Sloper, who was then staying at Aix-en-Provence, to the insufficiency of the distinction generally given for recognising *A. tagis* var. *bellezina* at a glance as compared with *A. belia*, viz., the presence of a black spot nearly in the centre of the hindwing on the underside of the former, which is usually absent in the latter. He had taken several specimens of *A. belia* in which this spot was distinctly visible, and in several cases these specimens were also smaller than var. *bellezina*. A short stay at Aix-en-Provence at the end of April has not only confirmed for me the truth of this observation, but has besides shown me that this black spot is also occasionally present in the same position in *Euchloë euphenoides*, both ♂ and ♀, and also more strongly marked in both sexes of *E. cardamines*. It is, however, sometimes visible in both sexes on the upper side of var. *bellezina*, though I have never met with a corresponding example of any other species. Of course, in the field, or in cases where a date is attached to the specimen, there is no difficulty, as the first brood of *A. belia*, with which var. *bellezina* is contemporary, has silver in the place of white on the underside hindwing, but in all cases a very sufficient distinction may be found in the shape of the hindwing. On examining the underside of *A. belia* it will at once be seen that the costa of the hindwing is at right angles to the body, and there is a very conspicuous angle between the costa and the hind margin of the wing; this is entirely absent in *A. var. bellezina*, in which there is no break between the costa and the hind

margin, both being in the form of a single continuous curve. This distinction will, I believe, be found to be invariable.

Cupido osiris, Meig.=Cupido sebrus, Bdv.

By J. W. TUTT, F.E.S.

The following matter comes outside the scope of my work in *A Natural History of the British Lepidoptera*, and, as I have already finished what I have to say about the Cupidid species in vol. x of that work, it may be well to note the fact whilst it is in my mind, *viz.*, *C. osiris*, Meig.=*C. sebrus*, Bdv.

I have been recently working through Meigen, an author whom one would have supposed Staudinger knew very well, and yet whose work appears to have been a good deal overlooked; probably this is due to the fact that, like so many authors who illustrated their work by hand, the colouring is sometimes wonderfully crude, and, as Esper and Gerhard love "royal" blue, Bergsträsser "white" blue, so Meigen loved "pale" blue, and one finds the figures of the "blues" often running to excess in these directions.

At first I thought that *osiris* must be a form of *C. semiargus*, but the figure was quite unsatisfactory from this point of view, especially the spotting of the underside of the hindwing, and it was not till I obtained a critical translation of the description from Mr. Sich that I saw, what I ought to have known at once from the underside, that the species must be *sebrus*. This description reads as follows:—

Above violet; fringe white, with black base; pale grey beneath; in the centre of each wing is a black transverse streak, then a curved row of small black eye-spots. ♂. The upperside reddish-blue, not so deep and much duller than in the previous species (*acis*), the black marginal border is absent, on the other hand, the fringes are, for half their breadth, deep black (which one might easily take for a black margin), the other half is white. The nervures are not black, only their terminations on the outer margin scarcely blackish; the underside is very pale reddish-grey, clearer and more delicate than in the previous species (*acis*); the basal third of the hindwings verdigris-green. In the centre of each wing lies a black transverse streak bordered with white; on the forewings there is a curved row of seven eye-spots and a similar row on the hindwings of six to seven spots; between the first and second, as well as between the fourth and fifth, there is an interval; at the base on the edge of the green are yet two eyespots, one below the other. Of this butterfly, I only possess the male, whose country of origin is unknown to me, it is certainly distinct from *acis*.

The description and figures together make it absolutely certain that the species here referred to is that we know as *sebrus*, Bdv. The description of the fringes would alone be almost diagnostic, but the spotting of the underside of the hindwing in the figure is equally so, and is identical with specimens in our own collection, in which spots 2 and 6 are wanting. The only point, perhaps, not in quite full agreement with the species is the colour-tint of the base of hindwings, which Mr. Sich translates for us as "verdigris-green," but which is rather "verdigris-blue" in most examples than "green," although a tinge of the latter colour is sometimes observable; strangely, Meigen leaves this out altogether in his figure. The synonymy of the species will, therefore, in future read—

Osiris, Meig., "Eur. Schmett.," ii., p. 7, pl. xlvi., figs. 3 a-b (1830). **Sebrus**, ? Hb., "Eur. Schmett.," pl. 172, fig. 854 (*ante* 1832); Bdv., "Icon.," p. 72 *pro parte*, pl. xvii., figs. 1-3 (1832); Tr., "Die Schmett.," x., pt. 1, p. 65 (1834); H.-Sch., "Sys. Bearb.," i., p. 116 *in part* (1843); Dup., "Cat.," p. 31 (1844); Frr., "Neu.

Beit., pl. 451, fig. 1 (1845); Staud., "Cat.", 2nd ed., p. 13 (1871); Frey, "Lep. der Schweiz," p. 21 (1880); Lang, "Butts. Eur.", p. 128, pl. xxxi., fig. 2 (1884); Rühl, "Pal. Gross-Schmett.," i., p. 293 (1891-5); Staud., "Cat.," 3rd ed., p. 88 (1901); Wheel., "Butts. Switz.," p. 24 (1903); Rebel, "Lep. Faun. Balk.," i., p. 193 (1903). **Saportae**, Dup., "Pap. Fr.," supp. i., p. 59, pl. ix., figs. 5-7 (1832).

We refer *sebrus*, Hb., "Eur. Schmett.," figs. 851-3, to *Cyaniris semiargus*, and so much of Herrich-Schäffer's description (*Sys. Bearb.*, i., p. 116) as refers to Hübner's figures. The rest of his description appears really to refer to *osiris*, Meig. = *sebrus*, Bdv., and it is possible that Hübner's fig. 854 also is *sebrus*. The date of this figure of Hübner's is uncertain, but as Boisduval quotes Hübner, it was evidently before 1832, the year in which Boisduval figured the species. We regret much to have to publish this statement, but there cannot be a shadow of doubt as to its necessity.

Lepidoptera collected at Cintra in April, 1909.

By THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S.

Between the 8th and 13th of April, this year, my wife and I made a small collection of lepidoptera at Cintra. Records from Portugal seem to be very meagre, and I, therefore, give a complete list of the specimens secured, hoping that it may prove of interest to the readers of *The Entomologist's Record*. Insects were scarce, both as regards species and numbers, a curious fact when the astonishingly rich vegetation of the district is considered. Sugar was a complete failure and light but partially successful. The species obtained were:

DIURNI:—*Papilio podalirius*, L., rather scarce; *Thaïs rumina*, L., scarce at low and high elevations; *Pieris brassicae*, L., common; *Euchlöe cardamines*, L., scarce. Only ♂'s were secured, in all of which the orange patch of the forewing extended beyond the cell spot. *Leptidia sinapis*, L., scarce; *Gonepteryx rhamni*, L., common; *G. cleopatra*, L., rather scarce; *Pararge aegeria*, L., var. *egerides*, Stgr., common; *P. megaera*, L., common; *Callophrys rubi*, L., common; *Thesprotia ballus*, F., common at low elevations; *Celastrina argiolus*, L., common.

LASIOCAMPIDAE:—*Trichiura ilicis*, Rbr.—A single female of this species with slightly worn fringes was secured. The specimen in question was flying very rapidly in the afternoon sunshine over the heather at a high elevation. In it veins 9 and 10 of the forewing are on a very high stalk, vein 9 being less than half the length of the stalk. In this female from Cintra and in another from Andalusia—the only two females I have seen—vein 9 reaches the edge before the tip of the wing, as in *Poecilocampa populi*, L., while, in the male, the vein terminates on the outer margin, as is the case in both sexes of *Trichiura crataegi*. Veins 7 and 8 of the hindwing are on a short stalk in the male and two females of *T. ilicis* examined. *Macrothylacia rubi* var. *digramma*, Meade-Waldo.*—Nine examples (two males and seven females) of this very distinct insect were secured at light at a high elevation. The male is more densely scaled than the female, and bears, on the underside of both wings, a yellowish discal line corresponding with the outer line on the upperside of the forewing. The genitalia agree with those of *M. rubi*. This moth might possibly be

* *Trans. Ent. Soc. Lond.*, p. 390, pl. xix., fig. 10 (1905): "Tetuan to Rabat, Morocco, on the sea-coast."

treated as a separate species rather than a geographical race of *M. rubi*. It has, so far as we know, not been previously recorded from Europe.

ATTACIDES :—*Saturnia paronia*, L., common at high elevations.

DREPANIDES :—*Drepana binaria*, Hufn., common at light.

ARCTIIDES :—*Arctia latreillei*, God., one specimen at rest at a high elevation.

NOCTUIDES :—*Agrotis puta*, Hb., at light; *Pachnobia faceta*, Tr., at light; *Leucania l-album*, L., at light; *Orrhodia staudingeri*, Gras. ab. *scortina*, Stdgr., one specimen at light; *Cleophana diffluens*, Stdgr., one specimen at light; *Anarta myrtilli*, L., common at high elevations; *Phytometra viridaria*, Cl., at high elevations; *Plusia gamma*, L., common; *Ophioches lunaris*, Schiff., rare at high elevations.

CYMATOPHORIDES :—*Thyatira batis*, L., rare.

GEOMETRIDES :—*Acidalia rittaria*, Hb., rare at low elevations; *A. virgularia*, Hb. var. *australis*, Z., at light; *A. eugeniana*, Mill., at light; *Zonosoma pupillaria*, Hb. ab. *gyrata*, Hb., one specimen at light; *Anaitis plagiata*, L., one specimen; *Chesias rufata*, F., rare at high elevations; *Melanippe fluctuata*, L., common; *Larentia cupreata*, H.-S., one specimen at light; *L. flarofasciata*, Thnbg., one example at light at a high elevation; *Eupithecia pulchellata*, Stph., a very large form, one specimen; *Tephroclystis scopariata*, Rbr., rare; *T. pumilata*, Hb., rare; *Metrocampa honoraria*, Schiff., rare at light; *Venilia macularia*, L., very common; *Hemerophila abruptaria*, Thnbg., very common; *Pachycnemia hippocastanaria*, Hb., common; *Gnophos mucidaria*, Hb., rare; *G. asperaria*, Hb., rather common; *Eurranthis plumistaria*, Vill., common at high elevations; *Thamnonoma gesticularia*, Hb., rare at light; *Lomaspilis petraria*, Hb., common; *Aspilates ochrearia*, Rossi, rare.

PSYCHIDES :—*Epichnopteryx pulla*, Esp., rare.

TORTRICIDES :—*Tortrix unicolorana*, Dup., one specimen; *Conchylis simoniana*, Stgr., one specimen at a low elevation.

The "Large Copper" Butterfly (*Chrysophanus dispar*).

By G. H. VERRALL, F.E.S.

As no accepted record exists of the occurrence of this species in Britain since 1848, I do not think I can be accused of acting in an unscientific manner by trying to reintroduce it through continental specimens. I have consequently (through the kindly help of Mr. J. W. Tutt) turned out a number of the larvae of the *rutilus* form at Wicken Fen, and I ask the support of all entomologists to preserve specimens from capture for some years to come, in order to see if this beautiful species can be re-established. It will also be interesting to see if, in the course of a few generations, any reversion to the British form *dispar* might occur.

I hear that an attempt is also being made to introduce the other " *dispar* " (*Lymnia*) at the same place, so British (?) records of this will also be valueless.

The Lepidoptera of the Grisons—the Landwasser Valley.

By J. W. TUTT, F.E.S.

One of the loveliest days during the holidays of 1908 proved to be a collecting failure. This was August 4th, when a journey to the

Bärenrett Gorge was undertaken. It proved a long dusty walk, and the attempts to discover by side routes, etc., places particularly suitable for collecting, added to the length of the journey but little to the bag, coupled with which most of the species met with appeared to be largely over; the fields were all mown bare and the crops carried, so that one suspected that the Landwasser Valley would have proved more productive a little earlier in the season. This was particularly the case near Frauenkirch, where, on a flowery slope among hundreds of *Pieris brassicae*, *P. rapae*, worn *Adopaea lineola*, *Anthrocera achilleae*, *A. transalpina* and *Chrysophanus hippothoë*, etc., one observed very few species in good condition, of which *Argynnis niobe*, *A. aglaja*, *Issoria lathonia*, *Aricia astrache*, *Heodes virgaureae*, *Agriades coridon*, and two quite freshly emerged *Melitaea athalia*, were perhaps the chief. One delightful little corner remains an exception to the rule. This was near Spinabad, where an open space, thinly covered with large trees and carpeted with flowers, came down to the roadside. Here many common species were in profusion, *Argynnis aglaja* and *A. niobe*, in dozens, the ♀s of the latter exceptionally dark on the upperside; *Brenthis ino* and *B. amathusia* also had been abundant, but were altogether passé, but *Erebia euryale* was in first-class condition, whilst *Issoria lathonia* swung from the flowers, ready to dart off like lightning, however, if disturbed, in all the beauty of fresh emergence from chrysalis; an occasional *Colias phicomone* reached here, having been evidently attracted by the flowers below its usual level, whilst *Aporia crataegi* ♀s with almost transparent forewings still sought a place in which to lay what few eggs remained to be deposited. Low down on the flowers many of the usual species were common, and *Aricia astrache*, *Cyaniris semiargus*, *Heodes virgaureae*, *Agriades coridon*, of which the ♀s appear to be exceptionally dark, both on the upper- and underside, one or two ♀ *Chrysophanus hippothoë* (most of the examples of this species in shreds), *Hesperia alveus*, *Urbicola comma*, *Adopaea lineola*, and *Coenonympha satyron*, made up the greater part of the Rhopalocerous bag. There were a few other interesting species noted, of which the chief were:—*Larentia caesiata* on the tree-trunks, *Dasydia obfuscata* frequently disturbed here, and in suitable spots all the way down the valley, *Crambus dumetellus*, and an *Anthrocera*, apparently *ochsenheimeri*, but which I cannot name with any real certainty. Lower down the valley, towards the Schmelzboden Hoffnungsau, the same species largely occurred, but nothing really worth noting, except, perhaps, a specimen or two of *Cyaniris semiargus* at a runnel by the roadside below Glaris. The failure of an observation on the egg-laying of *Argynnis aglaja* at Spinabad may be worth recording if it only attracts someone else to record a successful observation. As I sat in the shade of a tree at lunch at a spot where *A. aglaja* appeared particularly abundant, a ♀ was observed in the most business-like way at what I considered must be the process of egg-laying. She hovered an inch or two above the ground, at a spot where violets were growing, but the grass and other herbage sparse, dragged herself over the violet plants, abdomen downwards, and then took up a position among the drier grass, quite near, but not actually among, the violet-roots, her abdomen was poised, bent under, and a movement of an inch or so forward made, when the operation was repeated, and this happened at least four or five times, until craning forward to within a few inches of her, I

startled her, and she flew away. I was so certain that I should find the eggs that the matter troubled me little, but, although I lay there until I had examined individually almost every bit of grass and dry material in the path she took, I could find no egg. I followed up another ♀ later, and spent altogether quite half an hour, but with no result whatever. Knowing that the eggs were possibly not laid on any herbage at all, I examined the surface of the ground, etc., but all to no purpose. Eggs, however, are easily overlooked, and they may have been there, but I think not.

Two Generic Homonyms: *Aricia*; *Trichopteryx*.

By LOUIS B. PROUT, F.E.S.

The investigation of the former of the above names has been made on behalf of Mr. Tutt; that of the latter, on my own behalf. They are but two of very many which will have to be laboriously pursued before finality in the appropriation of many homonyms can be arrived at. Bibliographers will find two others published by me in *The Entomologist*, xxxii., p. 115 (*Luceria* and *Sora*).

ARICIA, R.L., *Jena. Ally. Litt. Zeit.*, 1817, vol. i., no. 35 (Feb., 1817), p. 280. The name is valid, being founded on a "bibliographic reference,"* *i.e.*, proposed for Oehsenheimer's "Family A" of his *Lycaena*. But the question has been raised by Mr. Percy Grimshaw (*in litt.*) as to whether I was right in handing the name to Mr. Tutt as actually available for use, seeing that the nomenclators quote another "*Aricia, 1817*," in *Vermes*. As a matter of fact, a gross and palpable error has been made in Agassiz; *Aricia*, Sav., *Vermes*, ought to have been quoted for 1826, not 1817, for Savigny's *Système des Annelides*, though presented to the French Academy of Sciences in 1817, was not published till 1826, and the author of this section of Agassiz knew it, for he records the fact in his introductory bibliographical list. However, even if Savigny's unpublished name crept into the literature of his period (as is unfortunately often the case in such circumstances, though I have no knowledge of its occurrence here), the early date of "R. L." fully assures his priority.

TRICHOPTERYX, Kirby, in Kirby and Spence's "Introduction to Entomology," iii., p. 40, note (1826). This name has always been current among coleopterists, and even forms the basis of a family; and although it was badly founded, we cannot reject it as a *nomen nudum*. Kirby's footnote to the "*Silpha*" *minutissima* of Marsham, says it cannot remain either with that genus or *Dermestes*, *Scaphidium*, or *Latridius* (to each of which it had been variously assigned), but is "sufficiently distinguished from them and every other insect by its singular capillary wings," and stands in his cabinet "under the name of *Trichopteryx*, K." However, Hübner's "Verzeichniss" (probably published late in 1825, during 1826, or possibly not until the beginning of 1827) also offers a *Trichopteryx* to lepidopterists (p. 323, for *lobulata*, *hexapterata*, *secalata*, *viretata* and *decolorata* of Hübner), which is even better founded than Kirby's, an orthodox (though brief) "generic diagnosis" being given, referring to the "supplementary wings" on the posteriors; and Meyrick (*Tr. Ent. Soc.*

* *Science*, xxvi., p. 522, note B in Art. 25 and of the Introduction Code of Nomenclature.

Lond., 1892, p. 61) has resuscitated the name for *viretata*, *carpinata* (= *lobulata*) and others not Hübnerian, without mentioning the possible homonymy.* The type is *carpinata*, chosen by Pearsall (*Journ. N. Y. Ent. Soc.*, xv., p. 132), even if not earlier fixed by the "Merton Rules" (*vide* Stephens' *List. Brit. Anim.*, p. 199), or by the "first species rule." If *carpinata* and *viretata* were really congeneric (which they are certainly not †) we might evade the question of priority in *Trichopteryx*, for *viretata* is abundantly supplied with generic names—*Acasis*, Dup. = *Bryodis*, Gppbg. = *Agia*, Hulst. On the whole, in the absence of certainty of exact dates, it seems right to leave *Trichopteryx* to the coleopterists, and to rename *Trichopteryx*, Hübner (Meyr. et Pearsall, restr.; there is an excellent characterisation in *Journ. N. Y. Ent. Soc.*, xv., p. 132, to exclude the *viretata-riridata* section). I propose for this genus, as defined by Pearsall (type, *carpinata*, Bork. = *lobulata*, Hüb.) the name of *Nothopteryx*, Prout, nov. nom.

I may add that Hübner's *Trichopteryx* was originally almost equivalent to Curtis's prior *Lobophora*, and contained its type (*halterata*, Hufn.); and this would, in the eyes of some workers, debar its use *in sensu* Meyrick. Art. 80, Rule 8 of the "Code," enforcing this principle, has fortunately been cancelled, and we are, therefore, not bound by it, but I mention the fact because it may win the adhesion of a few free-lances (who still prefer their own hobbies to an international system) to my proposed change to *Nothopteryx*.

* It must be borne in mind that when Meyrick wrote, an earlier date was assumed for Hübner than is now considered possible—at least for pp. 305 seq.

† As *ex cathedra* statements do not advance science, I may digress to point out that, apart altogether from early stages, and from slight differences in shape, *viretata* is separated by its long palpi, its hindwing neuration, etc.; in *viretata* the discocellulars of hindwing are biangulate, with vein 5 from near 4, and in its ♂, 8 anastomoses with the cell, whereas in *carpinata* ♂ it is separate, connected by a bar at the end.

Girdle-spinning of *Laertias philenor*.

By CECIL FLOERSHEIM, B.A., F.E.S.

The following notes are the results of observation of a larva of *Laertias philenor* which spun its pupal girdle on the fine hot morning of July 27th of the past year (1908).

Having completed its anal pad and the silken carpet which, though obviously the survival of the old cocoon-making habit (the larva still attempts at times to weave in the air and tosses its head about just like the larva of *Saturnia paronia* (*carpini*) when spinning its cocoon), serves now the useful purpose of providing a secure foothold,* the larva with its anal claspers securely fixed just above the pad began weaving its girdle. This operation had been preceded by a quiescent interval of about five minutes, at the end of which the larva trembled convulsively several times.

It started on the left-hand side by fixing down a thread which it caught just like someone playing catch-cradle, with a rapid movement of the first two pairs of thoracic legs in the suture between the legs, and then carried it there, bending back its head and segments down to the first pair of prolegs, which were continually off the surface of

* A larva which I removed from its carpet fell to the floor of the cage, made no further attempt to affix itself in its normal position, but pupated successfully *in situ*.

the box—the second pair of prolegs moving round but adhering. It kept its back concavely arched all the while in order to keep the thread taut till it reached the right-hand side of the box. This done it touched the side with the first two pairs of thoracic legs, which, during the circular movement, it had kept fully outstretched at right angles to its body whilst feeling about with its mouth for a suitable spot for fixing the thread. Having fixed it down, for which purpose it always made a quick movement with the first pair of thoracic legs as though to guide the girdle and pull it taut, it fixed another thread outside the former one, and always brought it back inside by crossing it about an eighth of an inch from the surface of the box and then stretched its thoracic legs again out at right angles as it did so.

Each thread was carried below the former one, *i.e.*, nearer the second pair of thoracic legs in the suture between the two pairs, and the operation, which took in all one hour and twenty minutes, was repeated seventy-four times in the individual which I had under observation. By-the-bye, it spun an unusually stout girdle for *L. phileenor* (quite a third thicker than was the case with most of my larvæ). Under the vitascope I could now see that the complete girdle, though apparently one to the naked eye, was in reality composed of close but separate threads.

The larva without making any further pause passed its head under the left-hand side of the loop (like a man putting on his shirt), and wriggled, arching its back violently, until the girdle was in its proper position.

The Lepidoptera of the Grisons—The Fluela Pass.

By J. W. TUTT, F.E.S.

With our visit to the Sertig-Thal on August 5th, 1908 (see *anteā*), we determined to make a move, indeed, the visit to Davos was only a passing desire to know what the country around was like entomologically and otherwise, for, long before, it had been mentally agreed that the summit of the Fluela Pass, and the higher slopes of the surrounding mountains, would prove a very suitable hunting-ground, and so, no doubt, it would, but, with a portion of the bad luck experienced on this journey, which arranged itself somewhat perversely and contrary to our desires, we found ourselves travelling in fine, and settled down to spy out the country in wet and cloudy, weather. At any rate, the stay at Fluela was the most unfortunate we had experienced for a long time. The morning of August 6th was dull and threatening, but rain did not really fall till we were well in the Fluela-Thal, and then, in spite of one or two showers of sleet, there were moments when the sun shone with brilliancy and power, and one hoped that the weather might improve. However, by the time the summit was reached we were in a steady downpour, the lakes, no doubt lovely in fine weather, only added to the surrounding wetness and feeling of uncomfortable-ness ; it poured all day and night, all the next day and night without intercession, but, waking early on the morning of the 8th, the sun was shining on the mountain opposite, and hope was revived. Closer inspection of the sky, however, was not too promising, yet, by fits and starts, the sun promised something brighter, and after an early breakfast we started out. The tops of the mountains were still shrouded in

clouds, which now and again drifted down to us, so that a start down the valley, rather than up the mountains, seemed advisable. The air was keen and chill, and, as we walked along the upper part of the path, the ground, pictured under a hot sun as alive with the high alpine Erebias, disclosed not a wing, and it was not until the tree limit was reached that the sun seemed to have warmed the earth. Then for about half-an-hour we walked through the scant, sun-lit pines, and picked up unconsidered trifles by the way—trifles that soon filled our zinc-box, and made us wish that the sun were at least equally warm 1000 feet higher, although we noted now with chagrin that the upper part of the valley was again in cloud. Guessing what might happen, we walked on, getting as low down the valley as possible. Swarms of *Argynnис niobe* and *A. aglaia* were noted, a still greater abundance of *Erebia goante*, *E. tyndarus*, and *Melampias melampus*, dark *Pararge maera*, and small but fine *Brenthis amathusia*, swift-winged *Colias phicomone*, hundreds of *Heodes virgaureae*, the ♀'s much brighter in the lower part than those taken higher up the valley, the ♂'s occasionally with clearly-marked discoidal lunule on the forewing; darting *Hesperia alvens* and *Urbicola comma*, *Coenonympha satyrium*, worn *Melitaea dictyna*, and hardly more satisfactory *M. athalia*, a single worn example each of *Cyaniris semiargus*, *Abulina pheretes*, and *Melampias epiphron*, whilst fluttering across the path were many *Fidonia pinetaria*, and *Anthrocera transalpina* came up to sun on the flowers; the rapidity of pairing of this last-named species is very remarkable; as I stood for a moment speculating whether I would box a fine, apparently newly-emerged ♀, a ♂ appeared on the scene, and before even a thought could pass to prevent it, the insects were coupled, the ♂ still and lying lengthwise on the grass-culm below the ♀ without a move or quiver of its body. *Aricia astrache* came to the damp roads, but this was the only "blue" seen there. An occasional dash up the bank resulted in *Merrifieldia tridactyla* (*tetradactyla*), *Adkinia graphodactyla*, and *Eubolia mensuraria* being added to the bag, and then a cold chill swept down the valley as the sun disappeared and the first rain began to fall. Yonder, only a mile or so away it seemed, the sun still shone, but they were the mountains on the other side of the main valley of the Lower Engadine, and the spots we could see possibly two days' journey distant. There was nothing else to be done, and we turned round and walked back, at first slowly, then more quickly, until at last we took shelter in one of the avalanche galleries, from the pitiless rain. Here we disturbed numbers of *Larentia aptata*, *L. verberata*, *L. caesiata*, *Dasydia obscurata*, and a large Noctuid whose name escapes us, but the weather only got more and more infernally hopeless. We looked back, the sun still shone on those mountains "just across the road," but our traps were upwards, and we faced it and walked on—on and on up the storm-swept path, without the slightest trace of shelter which, indeed, now we did not want, for we were too wet to dare stay anywhere in such wet clothes, and so on, whilst the draggled diligences with their load of tourists from Nauders, St. Moritz and Pontresina, *via* Sus, climbed up slowly behind us; we took the short cuts and reached the summit well ahead, and had washed and changed our soaked clothes by the time lunch was served, and the visitors went, and we remained. Never before did we feel so much the nuisance of a restless temperament, nothing to do, nowhere to do it, the clouds

enveloping one. As the afternoon passed, the place became unbearable, a closed carriage that had been drawn up under shelter of the Hotel, with its driver inside the latter, was too tempting, and by 6.30 p.m. I found myself out of the clouds, rain, and wet, comfortably clothed, and waiting for dinner at the Hotel at Sus, and persuading myself that there were things in life as important as *Erebia gorge*, *E. glacialis*, and *Anthrocera eulans*. The next morning broke—cloudless—not a wisp on the mountains that surrounded the summit of the Fluela, but it called me no longer; the hot sun shone on Sus, and after my ignorance of its power for some days, I just revelled in it. I required a sun-bath and got it.

Lepidopterological Observations in Ceylon in December.

By CECIL FLOERSHEIM, B.A., F.E.S.

The following notes on the butterflies observed in Ceylon during a brief visit to that island in the December of last year (1908), may be of interest to some readers of the *Ent. Record*. The species described are mostly well-known, but, as the eye of the observer was new to the phenomena of tropical life, the strangeness of the medium may, in some measure, atone for the familiarity of the subject-matter. My wife and I arrived at Colombo on the morning of December 6th, and our introduction to the Sinhalese lepidoptera was not long delayed, as we had scarcely left the ship's side in the row-boat which was to convey us across the harbour to the landing-stage, when a large red, black, and white *Papilio*, resembling somewhat a gigantic *Pyrameis atalanta*, flew across our bows. On the long and glaring way to the Galle Face Hotel, I saw others of the same species, identified later on as *Papilio hector*, as well as many *Papilio demoleus* and *Hypolimnas bolina*, which, intermingled with numbers of a small yellow *Terias*, flew along the open lawns which border the sea-shore. The butterflies were very conspicuous against the vivid green of the grass, and its background of palms and other tropical vegetation which entitle Ceylon, rather than Ireland, to the name of the Emerald Isle. During the remainder of my visit I never met with *Papilio demoleus* again in the same abundance, but *Hypolimnas bolina* I found ubiquitous, and, indeed, next to the various species of *Terias*, which seem to take in Ceylon the place which their cousins, the white Pierids, occupy at home, the commonest butterfly in that island. A drive in the outskirts of Colombo during the afternoon brought nothing new in the entomological way, but I was surprised at the abundance of *Papilio hector*, of which gorgeous insect I counted no fewer than ten in sight at one time on a piece of waste ground near the race-course. Most of these must have been females, for those I watched were flying slowly at a distance of some three feet from the ground in and out of the tangled undergrowth, in apparent search for the *Aristolochia*, on which they oviposit. On the following day we left Colombo for Kandy, and the leisurely rate at which the train proceeds after leaving the low country, gave us opportunity both to enjoy the magnificent scenery and to observe the butterflies by the wayside, amongst whom I noticed *Papilio agamemnon*—remarkable for its swifter flight—and *Papilio polytes* and *P. aristolochiae*, as well as most of the usual *Terias* and *Hypolimnas bolina*. The first morning of our short stay at Kandy was spent in a visit to the famous botanical gardens at Peradeniya, and on

the drive thither we saw a large blue and black butterfly which dashed up from the roadside and proved to be *Kallima philarchus*. The gardens themselves are so beautiful and the profusion of flowering trees and shrubs so bewildering that whatever butterflies were present passed unnoticed during the first few minutes; but, on entering the spice plantation whose culinary virtues proved of more absorbing interest to my wife than myself, my attention was drawn to a medium-sized dark brown butterfly (*Junonia iphita*) with somewhat sickle-shaped forewings, which settled amongst the dead leaves at my feet, where, indeed, I had some difficulty in discovering it, and, on looking up, I saw a magnificent female *Troides (Ornithoptera) darsius* in the act of settling on a small evergreen tree at no great distance from me. There it rested displaying the yellow and black of its expanded wings at a height of about fourteen feet from the ground, reminding me much in its choice of position and attitude of *Laertias philenor* which I have often observed acting in a similar manner on the laurels at home. My nearer approach did not appear to concern it in the least, and it allowed me to inspect it for quite three minutes before it flew off leisurely through the trees. On emerging from the plantation into the road, which runs through the gardens, I noticed a tailed, blue Lycænid, probably *Jamides bochus*, flying about and resting on the bushes in the hot sunshine, and, on coming to a tree of some kind of citrus (unnamed) a little further on, I surprised a female *Papilio polytes* in the act of ovipositing, which she performed in the usual *Papilio* manner; with wings fluttering; she laid her eggs singly, flying off for a short distance and then returning to the foodplant. She, however, took fright at my presence, and, though I looked, I was unable to find either of the two ova I saw her deposit, before she flew away. On returning to the same tree a week later I made a diligent search for larvæ, but found only one, and, as that was in its third instar, I can hardly imagine that it can have been of her offspring, in spite of the more rapid development of life in the tropics. Before leaving the gardens I came across several specimens of *Papilio aristolochiae*, all flying very slowly only a few inches from the ground, which was so thickly carpeted with the sensitive plant that its surface seemed to shrink as I advanced to watch their movements. In the afternoon we made an expedition to Lady Horton's drive, which, I was told, was a good place for butterflies, but we met with nothing of great interest. *Papilio parinda*, which I hoped to see, did not make its appearance. *Papilio aristolochiae* was in abundance, and I saw several *Papilio agamemnon* as well as the only specimen of *Papilio ulysses* which I came across during my stay up country. On the following morning we left Kandy for Nuwara Eliya.

A circumstance which forced itself on my attention at Kandy, and, indeed, had already begun to do so at Colombo, was that, although I saw butterflies in a greater profusion, both as regards species and individuals, than I had been used to at home, I did not notice any feeding on flowers. The latter were, perhaps, rather less abundant than in some places in temperate climates, their place being partly taken by a variety of tall flowering shrubs and trees—about which, however, I observed no butterflies—but, during the whole fortnight I was in Ceylon, I saw on three occasions only butterflies, with the exception of the small yellow *Terias*, feeding as they do in Europe.

These were *Danais taprobana* on a kind of bramble, and *Papilio agamemnon* and *Atella phalanta* both at a plant with *Eupatorium*-like flowers, all three being at Nuwara Eliya. I wonder whether others, who have had more opportunity than I of observing insect life in the Tropics, have noticed the same thing, or whether it was mere fancy on my part. Perhaps the struggle for existence in these teeming regions is so much keener that insects have little time except to hunt for their mates and oviposit, and the very fact that so large a proportion of the successful plants are trees that bear their flowers high up, may point to a greater reliance on wind-fertilisation than with us.

Nuwara Eliya, a sort of Switzerland where rhododendrons and other evergreen shrubs and trees clothe the mountain-sides, instead of pines, promised a fauna quite different from that of Kandy; but, with the exception of some additions, the butterflies noticed were much the same. The morning after our arrival was cloudy, and as there had been a hoar-frost during the night, we did not expect to see many insects on the wing; but a drive to the botanical gardens at Hakgala brought us into a region of fitful sunshine, and we came across the following species:—*Danais septentrionis*, one or two in the gardens; *D. chrysippus*, abundant; *Junonia iphita*, two in gardens; *Hypolimnas bolina*, common, as usual, everywhere; *Vanessa haronica*, one in gardens; two kinds of *Lycaena*, unidentified, in gardens; *Catopsilia crocale*, one on way back to Nuwara Eliya; *Papilio mooreanus*, one specimen, which flew out of the jungle across the road in the gorge leading to Hakgala; *Papilio teredon*, two or three flying rapidly about in the gardens; *P. demoleus*, several, one of which, when settled on a shrub, allowed me to handle it before it flew away; *P. agamemnon*, also several—this was the *Papilio* which I saw most frequently in the Nuwara Eliya district. In the afternoon, the weather having cleared and the sun come out, I walked to the jungle behind the hotel where we were staying, and had the good fortune to come across a number of *Danais taprobana*, a striking large brown and white butterfly, and one of the few peculiar to Ceylon, particularly common in the Nuwara Eliya district according to De Nicéville. Those I saw were confined to a few small clearings in the lowest part of the jungle, and were sporting themselves fearlessly in the hot sunshine, only pausing at times to rest or feed on a kind of bramble. Their flight was of an easy floating nature, and they did not appear to be in the least alarmed at my presence. During the remainder of my stay at Nuwara Eliya, I returned each afternoon to watch them, and always found them in the same place. I never noticed any attempt at courting amongst them, and their behaviour was in marked contrast with that of most of the species I observed in Ceylon, where even the *Aristolochia*-feeding Papilios seemed generally engaged in the more serious business of life.

The night was a cold one, with a return of the hoar-frost, which I was told afterwards did much damage to the neighbouring tea-plantations, and, on walking down the drive leading to the Hotel before breakfast, I found a fresh and perfect specimen of *Papilio agamemnon* lying dead in the road; a few yards further on I met with a male *Hypolimnas bolina* so numb that it lay on its side and could not move. Three hours later, after exposure to the sun, it flew away. The day was now hot, and we spent the morning in Lady Havelock's walk, near Nuwara Eliya, the shadiest spot we could find, and one of

great natural beauty. *Atella phalanta*, one of the two Sinhalese Argynnids, was fairly common along the banks bordering the walk, with the usual *Terias*, and one or two *Danais septenrionis*: and I came across the only specimen of *Papilio agamemnon* during my visit to Ceylon which allowed me to observe it closely. It was feeding with wings quivering almost as rapidly as those of *Plusia gamma*, and dashing restlessly from flowerhead to flowerhead of a *Eupatorium*-like plant in a clearing in the jungle which was hung with the Crimson Passion-flower.

A visit to Lady Horton's walk in the afternoon yielded one specimen of the other fritillary native to Ceylon, *Argynnis hyperbius*, but it was too late for many butterflies to be on the wing. The following morning broke rainy and cold, but, on the weather clearing somewhat, we went off in rickshaws to the Rambodda Pass, certainly the most beautiful of the many beautiful views we saw in Ceylon. As I stood watching, "The blue haze-craddled mountains spread away," a familiar friend, in the shape of *Pyrameis cardui*, settled close to my feet. Though it was still showery when we returned to Nuwara Eliya we went to our favourite Lady Havelock's Walk, and, just before entering the wood in which it begins, I picked up a female *Troides darsius*, evidently killed by the cold of the night before. It was lying in a ditch and still beaded with dew. It was quite perfect, except for a patch torn from one of the forewings, and its abdomen was fairly full of ova. Later on in the day, I found a *Junonia iphita*, also quite fresh, lying dead in the roadway at Queen's Cottage. Indeed, as far as I could judge, the mortality amongst butterflies at Nuwara Eliya from cold must be considerable. Yet from other causes it must be even greater, for, whilst a dead butterfly or part of one is an unusual sight in England, there, in the highlands of Ceylon, I used frequently to come across their wings, most often single or several close together, but sometimes with thorax attached, and sometimes almost the entire insect. This is of course exclusive of those I found killed by the cold. All the wings, etc., I found, were under some trees bordering, for about one hundred and fifty yards, both sides of the road which led to the Hotel where I was staying, I found none anywhere else, though I searched diligently in all the neighbouring roads and ditches. Hence I concluded that something must have devoured them in the trees, probably birds, for though lizards—geckos—abounded on the lawns, I could find no fragments there. Curiously enough, among the "disjecta membra" were *Danais septentrionis* and *Euploea aeola*, protected species, but I noticed that the only cases in which the whole of the bodies had not disappeared was with these. Three Papilios, *P. polytes*, *P. agamemnon*, and *P. demoleus*, were amongst the victims; but by far the heaviest toll was taken of *Hypolimnas bolina*.

We went once more to Lady Havelock's walk on December 18th, the last day of our stay at Nuwara Eliya, but came across nothing fresh there except *Vanessa haronica*, a solitary individual of which we saw sucking up moisture from the road after a heavy shower, and our return visit to Kandy proved most disappointing, as it rained almost continuously from the moment of our arrival, until we left that beautiful but enervating spot to re-embark at Colombo for our "journey homeward to habitual self." The single hour's intermission from the deluge which we were vouchsafed, gave us the opportunity to re-visit Lady

Horton's drive, and here, amid the reeking moisture, we found a few butterflies on the wing, *Kallima philarchus*, and *Papilio aristolochiae*. I was fortunate enough to witness the courting of two of the latter. It reminded me strangely of that of *Pieris rapae*, only the insects never rose more than three feet from the ground. They fluttered slowly, one a foot or so above the other, for some time without any attempt to pair, disappearing at length into the tangled recesses of the jungle where I was unable to follow them.

In conclusion I must thank Dr. Willey, the curator of the Colombo Museum, for the kindness and courtesy he showed me, and for the pains he took in helping me to identify some of the species I saw during my all too brief stay in Ceylon. Throughout this paper I have followed the nomenclature adopted by de Nicéville and Manders—"List of the Butterflies of Ceylon," *Journal of the Asiatic Society of Bengal*, vol. lxviii., pt. ii., pp. 170 *et seq.*—for a knowledge of which I am also indebted to Dr. Willey.

A Note on the Dispersal of Coleoptera.

By W. E. SHARP, F.E.S.

Possibly some readers of this Magazine, especially such as may be coleopterists, may remember a graphic account which appeared in its pages in the year 1901 (vol. xiii., pp. 12, 1901) by Messrs. Tomlin and Sopp, of a flight of coleoptera which, presumably emerging under the stimulus of a hot day after cold wet weather from the recesses of the Llanberis valley, rose high in the air, were carried some distance by the wind, and finally dropped into the waters of the Llyn dûr Arddu, on the flanks of Snowdon wherein many of them miserably perished. This scene was recalled with emphasis to my recollection by an analogous spectacle of which I was a recent witness on the Yorkshire coast.

It will be remembered how, during the early part of last May, a cold N.E. wind dominated these Islands, if not actually checking insect life at least rendering it unobtrusive, how, about the middle of the month the wind suddenly veered to the S.S.W. and the temperature rose 15° to 20° in a day. It was the day after that strong, if transient, touch of summer that I happened to be near Bridlington in Yorkshire, and my attention was there arrested by the enormous number of beetles of various common species crawling on the wet sands or left for drowned by the receding tide on the shores of that bay. Innumerable corpses of *Gastroidea polygoni* dotted the beach like minute blue shells, they fell in clusters from the shaken sea-wrack, and even on the sea-front of Bridlington, its streets, its walls, its benches, they suggested the fourth of the plagues of Egypt.

The explanation of all this seemed not far to seek. The sudden warmth and sunshine after a week or more of cold and gloom had impelled innumerable individuals of a few species over all the arable land that lines the Yorkshire coast, with one accord to take to the wing; rising high in the air they had been carried by the S.W. wind out to sea and therein, either because of a lull in the wind, or simply through the exhaustion of the beetles themselves, dropped, to be partially returned by the flood tide and cast up on the shore with the weed and flotsam of the sea.

For it seems only probable that these survivors formed but an attenuated minority of the original emigrants, vast numbers must have perished in the open sea and no doubt during that week the fish of the Dogger enjoyed unusual fare. It was on the beach south of the town where I observed these ill-starred mariners in greatest abundance—more precise data as to their numbers here may be of interest. Within one lineal foot, approximately, measured off on the shore, I counted eighty-three specimens of *G. polygoni* between the foot of the cliffs and the sea, and on one flat stone with a superficial area of some two square feet sat no less than one hundred and thirty beetles belonging to about seventeen different species—in fact every large stone on the shore was covered by them there; they sat drying themselves in the hot sunshine rapidly back into life and activity, and it was noticeable that their disastrous experiences in the deep seem to have stimulated rather than damped their amatory fires.

As regards the species represented, all were such as readily occur on cultivated land, clover fields, and the like. *G. polygoni*, already mentioned, was easily first as regards numbers, then came three common species of *Sitones*—*S. flavescens*, *S. lineatus*, *S. crinitus*, four or five *Apiona*, such as *A. pisi*, *A. loti*, etc., then, very abundantly, *Mantura rustica*: the remainder was made up in much smaller proportions by such common *Tachypori* and *Tachini* as *T. rufipes* and *T. hypnorum*, *Aphodius ater*, *Eunicmus minutus*, sundry common *Rhinonchi* and *Ceuthorrhynchi* and rarely *Hypera polygoni*, in all, perhaps, not more than twenty species, although, among miles of beetles such as there were here, no doubt other and rarer species sporadically occurred.

I have thought the incident worthy of record at some length, because it appeared to illustrate in singularly dramatic fashion a factor which must operate very largely in the dispersal and consequent extension of range of coleoptera. Both it and the Llyn dŵr Arddu record as well as observations made on Coleoptera casually occurring on the summit of Ben Nevis (see *Annals of Scottish Natural History*, January, 1895), reported by Rev. A. Thornley, F.L.S., etc., seem to imply that a hot sunny day after cold and wet weather acts on beetle-life as an extraordinary stimulus to active, extensive, but apparently undirected, flight.

The operative agent of dispersal is undoubtedly the wind, not migratory instinct, in the proper sense of the term, on the part of the beetles, and, although at first it may appear difficult to understand how such a habit (of undirected flight) could have arisen, of which the result might be to the majority of the participants in it, irretrievable disaster, still it must be considered that such results are very largely local, partial, and due to the accident of insularity, and that, in larger continental areas, such a tendency might be conducive rather to the welfare of the species by the extension of its range than inimical by the destruction of a large part of its members.

Moreover, we may, perhaps, I venture to think, obtain some idea of how largely this habit of impulsive flight may imply the difference between species which are "common" everywhere and those which, for no physiological reason which we can detect, are generally rare or abundant only quite locally—for the former, their environment ceasing to be adapted to their needs, are in this way involuntarily moved on to "fresh woods and pastures new," while the latter, owing to their

immobility, perish in an environment which can no longer maintain them.

The Lepidoptera of the Grisons—Sus to Guarda.

By J. W. TUTT, F.E.S.

The morning of August 9th broke cloudless. Dr. Chapman had already some years ago made Guarda the centre of a long series of most successful collecting expeditions, so I thought I would like to see the village of Guarda, perched up on the side of the mountains, and overlooking for a long distance east and west the valley of the Lower Engadine. Two attempts were made to reach the village, both by way of Lavin and then over the mountain side to Guarda, both failed lamentably owing to the cupidity of the collector, on these delightful sunny days of August 9th-10th. They were just glorious. I have heard similar days described by all sorts of names—blazing, tropical, unbearable—but they were just glorious; they dried out all the accumulated wet and cold of the Fluela and one could at last live. There were millions of *Pieris brassicae* everywhere, the thistles in the cornfields near the town, abundant as they were, could not hold a tithe what wished to settle there; the thistles on the roadside and slopes dropping to the river as soon as one left the town swarmed with them, they were everywhere. The natives seemed to look on the butterfly-hunter as a godsend, for the white butterflies were a veritable plague. The larvae had devoured much of the garden produce, one suspected that a month later there was not even the skeleton of a cruciferous plant left in the district. *P. rapae* was also abundant, but not in the way that its larger relative was. Almost before the town was left behind the sport began. When one is in England, one does not catch lots of insects for various reasons, e.g., *Pyrameis atalanta*, *P. cardui*, *Vanessa io*, *Parnassius apollo*, *Argynnis adippe*, *A. aglaja*, *Colias edusa*, *C. hyale*, *Hipparchia semele*, *Euranessa antiopa*, *Aglais urticae*, *Epinephele janira*, *E. lycaon*, *Hesperia carthami*, and so on; when one is abroad one does catch them, and I had caught all these, except *E. antiopa*, which I missed—easily, in less than half-an-hour. One persuades oneself that it is necessary to get samples of everything one sees, if one is to report on the fauna of a place, one further persuades oneself that it is not safe to report anything one thinks one sees unless one handles it, and so one persuades oneself that one catches it for every reason except the real one, the pure, sheer, love of hunting. It was, indeed, a great pleasure to see *Parnassius apollo* again, the first I had seen this summer; it was grand to see *Euranessa antiopa* on the wing even if it did prove to you again, that it is far more alert than yourself, and, as for the large Vanessids on a thistle-bloom, what can be more lovely? But, although these and many more were seen on the steep flower-covered banks near Sus, other things soon attracted attention; a hasty bustling moth, with strange flight, necessitated a dash, and soon one was somewhat surprised to find a ♂ *Malacosoma castrensis* in the net, a little further on some fairly sized trees rather than bushes covered with webs, from which large numbers of *Hyponomeuta* (sp. ?) were emerging, this insect being quite one of the features of the valley; a steep rocky slope with a number of trees at its foot, proved the home of a fine large dark race of *Hipparchia*

semele, whilst, gliding to and fro on outstretched wing, with scarcely perceptible movement, was *Polygona c-album*, sitting almost suddenly at last on a leaf, drawing up its wings, and then slowly lowering them in the sun, just, as it were, to show how lovely it could be. From a thistle-head by the roadside a most interesting capture was made, a fine freshly-emerged *Polyommatus amandus*. From among the bushes came swarms of *Erebia aethiops*, fluttering in and out or resting on the flowers in the sun or on the road at the puddles of water left from the rain of the preceding days. At these puddles by the side of the main road was quite an abundance of *Agriades coridon*, *Hirsutina damon*, and a few *Vacciniina optilete*, whilst, in the village of Lavin, the solitary poplar tree observed had been sadly interfered with by *Leucoma salicis*, the imagines resting on the garden wall beneath, whilst the most lovely *Issoria lathonia*, in their freshest beauty, settled directly in front of one, displaying their colours in the sun, and then, at the slightest approach, snapping up their wings and darting off like an arrow to return and go through the same manœuvre, just a few yards in front, again and again, so that even on the main road there was plenty to interest one, and even to afford material for observation. At Lavin, one leaves the main road and makes for the slopes, across which the path leads to the conspicuous village of Guarda, but we never reached Guarda, although we struggled hard against adverse circumstances. Some of these circumstances are here set forth. Between Lavin and Guarda, three distinct obstacles present themselves as tending to prevent the entomologist from fulfilling the expressed wish to reach the next village: (1) Directly outside Lavin, a lane with flower-covered walls on one side and bushy slopes on the other, leading to a place where the bushy slopes cross the road and wild-flowers grow most luxuriantly, ending with a delightful spring which splashed great wet patches around. (2) A wide stony expanse of wind-swept slope, covered with flowers in full bloom, over which a breath of air just caused the flowers to nod in silent happiness, stretched away, acre upon acre, to the foot of the mountains, up which the dark pine trees swarmed in serried ranks as far as the eye could see from our position under the mountains. (3) A glorious open larch wood, with a mixture of birch and an undergrowth of barberry, elder, willow, buckthorn, etc., great clumps of *Epilobium*, *Centaurea*, giant Umbellifers, foxglove, scabious, and campanulas, and a carpet of golden-rod, *Gnaphalium*, *Hieracia*, clover, trefoils, *Echium*, labiates of different kinds, *Galium*, the lovely lace-edged pinks, and hosts of other flowers in full-bloom. Through these we slowly and gently struggled from about half-past ten in the morning till about four in the afternoon, gathering in lepidoptera, and being gathered in by diptera, until we had to confess ourselves beaten on both occasions, and returned weary, hungry, and happy to Sus and dinner. The ground here described was, on the two days we visited it, swarming with lepidoptera, many common, some worn, and all most interesting. The lanes beyond Lavin gave an abundance of Micros, the names of which do not easily recur to one who is allowing himself to get rusty, but there were *Catoptria candidulana*, *Dicrorhampha*, sp.?, *Pyrausta purpuralis*, *Ennychia anguinalis*, *Herbula cespitalis*, *Cranbus falsellus*, *Phycis subornatella*, *Argyresthia brockella*, as well as *Acidalia flareolaria*, *A. osseata*, etc. On the slopes an abundance of *Merrifieldia tridactyla* (*tetradactyla*), and

Stenoptilia pterodactyla, whilst *Oryptilus pilosellae*, apparently just emerged, had to be worked for most assiduously in order to make up even a very short series. On the banks also *Hesperia alveus*, *Adopaea lineola*, *Agriades coridon*, *Hirsutina damon*, *Erebia aethiops*, *Epinephele lycaon*, *Melitaea didyma*, *Issoria lathonia*, all abundant and in the pink of condition, whilst *Lithosia complana* was somewhat worn. At the spring *Plebeius argus* (*aegon*), *P. argyrognomon*, *Cyaniris semiargus*, *Aricia astrache*, *Vacciniina optilete*, joined *Agriades coridon*, *Hirsutina damon*, and *Erebia aethiops* at the drinking-station. Out on the open, the white butterflies swarmed again, whilst here and there a large *Parnassius apollo* flapped among them, without in any way incommoding them; here *Epinephele lycaon* was in great abundance, the ♂ with two faintly developed spots, the ♀s with bands of two distinct shades, pale and full fulvous, often stretching quite to the base, and sometimes with large and supplementary spots, often making 3 and sometimes 4 in the series; *E. janira* was less abundant, but *Argynnus aglaia*, and *A. niobe* were everywhere and *Colias edusa*; *C. hyale* also occasionally hurried by. *Erebia melampus* was in plenty as was *Hesperia alveus*, and more interesting still were fine dark *Melitaea phoebe*, only a few of which, unfortunately, were worth retention; *Coenonympha pamphilus* very pale in colour, but, when we reached the larch-wood the trouble began, the openings were garlanded with flowers, and the latter with butterflies, nothing rare, but many species that the eye delights to see, and the mind to follow—*Melitaea athalia*, *M. didyma*, *Argynnus adippe*, all providing some nice specimens, the former calling to mind the abundance of the species in Kent in the seventies, before it was exterminated in its nearest haunts to London for specimens; with them were a few *M. dictynna*, only two or three worth keeping; *Hirsutina damon* ♂s and ♀s, the latter just emerged, were in thousands; *Polyommatus hylas*, rare, and *Plebeius argus* (*aegon*) var. *killiasi*, most interesting. We sat long and watched the habits of this charming little butterfly, and have already detailed them in our *Nat. Hist. Brit. Butts.*, vol. iii., so that there is no need to repeat them; only in one favoured spot did we find *Heodes virgaureae*, the ♀s of which were most interestingly varied, a few *Loreia alciphron*, but worn, and two beautiful newly-emerged *Rumicia phlaeas* of bright colour; *Cupido minimus* also was worn. *Issoria lathonia* even invaded the wood, and chased the *Melitaea phoebe*, almost as swift-winged as itself. *Pyrameis atalanta* to the number of a dozen or more were sporting round some birch-trees, whilst *Hipparchia semele* dashed off the banks for a safer position as we disturbed them. *Enbolia bipunctaria* and *Acidalia mntata* were frequently disturbed, and the Deltoid, *Herminia modestalis* was just coming out, but already abundant, in both sexes, and easily disturbed as one walked through the undergrowth. *Anthrocera lonicerae*, *A. purpuralis* and *A. transalpina* were all in great abundance, the first two, however, going off in colour. Bustling *Leucania conigera* and *Dianthoecia comptula*, occasionally disturbed the feast, but the finest sport occurred, when, suddenly, a fine huge hawk-moth stood off a flower—probing with its tongue, whilst its heavy buzz filled up the foreground; a moment's poise is sufficient—swish—the flower and moth are in the net, and, in a moment, the moth is in the box, *Celerio gallii*, and not the relative expected, another a few minutes after, but this time hovering some distance away and refusing to stay a moment to let you get within

striking distance. Yet another up and down the roadside slopes just before reaching Sus, no possibility of reaching it, however, and after seeing it disappear and reappear three or four times I start to walk on, whilst a friend, more patient, waited for yet one more turn, and, as the big-looking creature swung in reach, quick as lightning it was struggling in the folds of the net. It was our last recollection of Sus, for we had arranged on the 10th to be back about 4 p.m., and when we arrived preparations for going were hardly completed before a local steed was ready to convey us to our next stopping-place.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, D.Sc., F.L.S., F.E.S., F.Z.S., etc.

(Continued from p. 13.)

Genus III: GRYLLODES, Sauss.

Brunner remarks that this genus differs from *Gryllus* more in its general appearance than in any particular character. The head is round and prominent: the eyes are small; the pronotum somewhat widened behind (in *Gryllus* the pronotum is always a trifle narrower behind). The elytra, in the ♂, are as long as the abdomen, but very short in the ♀. The front face of the anterior tibiæ has no tympanum.

All the species are natives of the Spanish Peninsula. Owing to their pale colour, crepuscular habits and great activity, they are exceedingly difficult to capture.

TABLE OF SPECIES.

MALES.

1. Elytra longer than abdomen, with long apical area, regularly reticulated, narrow and rounded behind; mirror of elytra ♂ transverse oval, divided by a gently curved vein..	1. MACROPTERUS, Fuente.
1.1. Elytra not longer than abdomen, apical area very short, irregularly reticulated and broadly rounded behind; mirror of elytra ♂ trapezoidal, divided by an angled vein.	
2. Elytra truncate behind with no apical area; chestnut	2. IBERICUS, Br.
2.2. Elytra broadly rounded, with very short apical area; greyish.	
3. Upper inner spur of hind tibiæ not surpassing half the length of metatarsus.	
4. Upper spurs of inner side of hind tibiæ unequal, the first longer than the second	3. PIPiens, Dufour.
4.4. Upper inner spurs of hind tibiæ equal.	
5. Larger and dark; head no wider than pronotum..	4. PANTELI, Caz.
5.5. Smaller and paler; head broader than pronotum..	5. ESCALERÆ, Bol.
3.3. Upper inner spur of hind tibiæ more than half as long as metatarsus..	6. LITTOREUS, Bol.

FEMALES.

1. Elytra a little shorter than abdomen; wings short	1. MACROPTERUS, Fuente.
1.1. Elytra very short, exposing nearly all abdomen; wings absent.	
2. Ovipositor longer than hind tibiæ; elytra, seen from side, seem longer than pronotum.	

3. Upper and inner spur of hind tibiae as long as middle one

3.3. Upper and inner spur of hind tibiæ as long as middle one.

4. Head with 4 yellow lines above; elytra longer than pronotum

2.2. Ovipositor shorter than hind tibiæ; elytra, seen from side, seem shorter than pronotum.

3. Head little broader than pronotum; ovipositor as long as hind metatarsus

3.3. Head much broader than pronotum; ovipositor little shorter than hind tibia

2. IBERICUS, Br.

3. PIPiens, Duf.

7. BOSCAI, Bol.

5. ESCALERÆ, Bol.

6. LITTOREUS, Bol.

1. GRYLLODES MACROPTERUS, Fuente.

Head dark reddish, with no yellow lines; straw-coloured, with darker spots. Length of body, 14mm. ♂, 13mm. ♀ : of elytra, 10.5mm. ♂, 7mm. ♀ ; of post-femora, 8mm. ♂ and ♀ ; of ovipositor, 5mm. ♀.

Easy to recognise by the very large head and relatively well-developed elytra and the presence of rudimentary wings in both sexes, and by the absence of the yellow lines on the head, which are so characteristic of its congeners. Cuidad Real.

2. *GRYLLODES IBERICUS*, Brunner.

Colour chestnut; the elytra of the female are not mere side flaps, but almost meet along the dorsal line. Length of body 15mm. ♂ and ♀; of pronotum, 2.5mm. ♂ and ♀; of elytra, 8mm. ♂, 3mm. ♀; of ovipositor, 6mm. ♀.

North Spain, Castroceniza near Burgos.

3. GRYLLODES PIPiens, Dufour.

Straw-coloured, with chestnut markings. Length of body, 12mm. ♂ and ♀; of pronotum, 2mm. ♂ and ♀; of elytra, 7.5mm. ♂, 2.2 mm. ♀; of ovipositor, 5.4mm. ♀.

This species occurs in Southern France, though rarely, at Saint-Cézaire, quartier des Clappières, Draguignan, Bagnols, Port-de-Siagne, Col de Broves, and Serres. The typical form occurs in Spain at Uclès and Camprodon; also in North Aragon, Escorial and Valencia. It varies considerably in size and colour. The following varietal names have been given—(1) var. *castellanus*, Bol.—Oña near Burgos; (2) var. *lusitanicus*, Bol.—Sierra de Estrella, Portugal; (3) var. *valentinus*, Bol.—Valencia; (4) var. *provincialis*, Finot.—Serres.

4. *GRYLLODES PANTELI*, Cazurro.

Straw-coloured, with 4 distinct pale bands on the head; pronotum somewhat narrowed anteriorly. Length of body, 15mm. ♂, 18mm. ♀; of elytra, 8.8mm. ♂, 2.8mm. ♀; of posterior femora, 9.5mm. ♂, 0.5mm. ♀; of ovipositor, 6mm. ♀.

Taken at Uclès by Father Pantel.

5. GRYLLODES ESCALERÆ, Bol.

Straw-coloured; intermediate between *G. panteli*, Caz., and *G. littoreus*, Bol.; in form it resembles *G. panteli*, in colour *G. littoreus*; in common with the latter species the ♀ having remarkably short elytra and ovipositor. The elytra of the ♂ are perfect, broadly rounded apically and sinuous at the ends. Length of body, 12mm. ♂, 10mm. ♀; of

elytra, 7.5mm. ♂, 1.5mm. ♀; of posterior femora, 8.5mm. ♂, 6.5mm. ♀; of ovipositor, 1.5mm. ♀.

Sierra Carpetana at Villaviciosa de Odon, near Madrid, Valladolid, Pielago and el Espinar.

6. GRYLLODES LITTOREUS, Bol.

Straw-coloured; coloration brighter and paler than in the other species; posterior feet notably long and slender, especially the spines of the outer border of the tarsi, the last spine being nearly as long as the terminal spur. In the shortness of the elytra and ovipositor it approaches *G. escalerae*, but these characters are less marked than in that species. Length of body, 12mm. ♂, 13mm. ♀; of elytra, 8mm. ♂, 1.5mm.-2mm. ♀; of posterior femora, 7mm. ♂, 4.2mm. ♀; of ovipositor, 3.5mm.-4mm. ♀.

Spain: Talavera de la Reina, near Toledo.

7. GRYLLODES BOSCAI, Bol.

♂ unknown. ♀ straw-coloured with chestnut markings. Allied to *G. panteli*: from which it may be distinguished by the still shorter elytra and by the having two yellow lines instead of 4 on the head above. Length of body, 12mm.; of pronotum, 2mm.; of elytra, 1.8mm.; of ovipositor, 6mm.

Eastern coast of Spain: Jativa and Valencia.

Genus IV: BRACHYTRYPES, Serville.

The single European species is easy to recognise by its great size and disproportionately large head.

1. BRACHYTRYPES MEGACEPHALUS, Lefèbr.

Very large and robust; tawny yellow; head disproportionately large; elytra and wings perfectly developed. Length of body, 40mm. ♂ and ♀; of pronotum, 6mm. ♂, 5mm. ♀; of elytra, 30mm. ♂ and ♀; of ovipositor, 3mm. ♂.

This giant cricket is a native of Sicily; it occurs near Palermo on the southern side of Val de Noto, on the sand-dunes near the sea between Terra Nova and Bavajo opposite Vittoria. It extends through North Africa as far as Senegal. Its stridulation is said to be extraordinarily loud and penetrating.

Genus V: PLATYBLEMMUS, Serville.

This genus is easy to recognise by abbreviated organs of flight and the remarkable veil-like appendage on the vertex of the male, and by the triangular head of the female.

TABLE OF SPECIES.

- Cheeks produced into horns. Elytra ♂ white, leathery, with no stridulating tympanum; vertex of ♀ acute 1. LUSITANICUS, Serville.
- Cheeks not produced; elytra bordered with whitish; and with tympanum: vertex in ♀ obtuse.. .. 2. CALIENDRUM, Fischer.

1. PLATYBLEMMUS LUSITANICUS, Serville.

Black; elytra whitish; easy to recognise by the horns of the cheeks, by the leathery elytra with no tympanum, by the large appendage of the vertex of the male, and by the acutely triangular head of the female. Length of body, 24mm. ♂, 23mm. ♀; of pronotum, 4.5mm. ♂, 4.1mm. ♀; of elytra, 4mm. ♂, 0.8mm. ♀; of ovipositor, 11.5mm. ♀.

Not common; under stones in dry places in Central and Southern Spain and Portugal; adult from May to July. The var. *ramburi*, Serv., with no horns on the cheeks, is recorded from Almadenejos and other localities. The ab. *minor* is only 18mm. long.

2. PLATYBLEMMUS CALIENDRUM, Fischer.

Easy to distinguish from the preceding by the black elytra having a tympanum and by the blunter head of the female. Length of body, 24mm. ♂, 17mm. ♀; of pronotum, 3.8mm. ♂ and ♀; of elytra, 6mm.-7mm. ♂, 1mm. ♀; of ovipositor, 8.5mm. ♀. A native of northern Africa, this species extends into Spain and is recorded from Cadiz and Chiclana.

Genus VI: PETALOPTILA, Pantel.

This and the two following genera were discriminated by Pantel as subgenera; if they deserve a distinctive name, they must, of course, have generic rank, but probably it were better to fuse all three into one, as the differences between them are proportionately less than the distinctions between the other genera of the family. Members of this group of genera are easy to recognise by their characteristic appearance, the presence of a process on the face, by the absence of tympanum on the anterior tibiae and the presence of minute teeth on the second basal quarter of the hind tibiae. This genus has lanceolate elytra, and the pronotum is somewhat rugose above at the base.

TABLE OF SPECIES.

1. Small; elytra ♂ almost rectangular; grey, with dark spots .. 1. ALIENA, Br.
 1.1. Larger; elytra ♂ oval, ochraceous.. 2. BOLIVARI, Caz.

1. PETALOPTILA ALIENA, Br.

Small; depressed; dark testaceous; eyes large; elytra slightly surpassing first abdominal segment. Length of body, 10mm. ♂; of pronotum, 2mm. ♂; of elytra, 2.2mm. ♂.

Occurs under fallen leaves and moss in most places in Central and Northern Spain; Montserrat and Espinelvas in Cataluña; Valencia; Villalba in the province of Cuenca; Panticosa. Superficially, it resembles *Nemobius sulrestris*, but differs in the generic characters.

PETALOPTILA BOLIVIENSIS Cazierro.

Ochraceous; elytra as in preceding but oval in outline; recognisable by its larger size and by its colour. Length of body, 17mm. ♂; of pronotum, 3mm. ♂; of elytra, 4.5mm. ♂; ♀ unknown.

Cabeso near Alicante and Tabernes near Valencia.

Genus VII: DISCOPTILA, Pantel.

Differs from the preceding in its convex, rounded elytra and smooth pronotum. A single species.

1. DISCOPTILA FRAGOSOI, Bolívar.

Parallel, testaceous. Length of body, 11.5mm.-12mm. ♂, 10.5mm.-12mm. ♀; of pronotum, 2mm.-2.2mm. ♂ and ♀; of elytra, 1.2mm. ♂, 0mm. ♀; of ovipositor, 6.5mm.-7.5mm. ♀.

Southern Spain; los Hermanos near Seville, and Seville, in May and July. This species is also recorded from Greece, the Crimea and Morocco.

Genus VIII: *GRYLOMORPHA*, Fieber.

As restricted by Pantel, this genus contains a few totally apterous species; they are all meridional.

TABLE OF SPECIES.

1. Small (7-10mm.) 4th external spine of hind tibiæ shorter than the following spur; subanal plate ♂ hardly surpassing supraanal plate 1. *UCLENSIS*, Pantel.
- 1.1. Larger (15-19)mm.; 4th external spine of hind tibiæ, longer than the following spur: subanal plate ♂ easily surpassing supraanal plate
2. Yellow with dark spots 2. *DALMATINA*, Ocsk.
- 2.2. Chestnut 3. *LONGICAUDA*, Ramb.

1. *GRYLOMORPHA UCLENSIS*, Pantel.

Small; dull, lurid testaceous with dark markings. Length of body, 7.5mm.-10mm. ♂, 7mm.-10mm. ♀; of pronotum, 1.2mm.-1.8mm. ♂ and ♀; of antennæ, 18mm. ♂ and ♀.

Remarkable for the pair of long horns on the supraanal plate of the male; it is the smallest of the group. Central Spain: Uclès, Sora, Pozuelo de Calatrava, Cortijos de Malagon and Montarco near Madrid. Southern France: Salgues near Lorgnes in Var in October (Azam).

2. *GRYLOMORPHA DALMATINA*, Oskay.

Yellow with dark spots; subanal plate of male emarginate at apex, the posterior angles inflated but not prominent; cerci very long. Length of body, 17mm.-19mm. ♂ and ♀; of pronotum, 3mm.-4mm. ♂ and ♀; of ovipositor, 12mm.-17mm. ♀.

Occurs in houses, old sheds, old walks, under stones in hot and dry localities throughout southern Europe. In France only in the extreme south: Montpellier, Cete, Beziers (in cellars); Avignon, Cannes, Hyères (in winter), Draguigan, Montauroux, Bagnols, Narbonne. In Italy at Naples, Voltaggio, Pegli, San Quirico.

In Spain it has not been definitely recorded, as it was for many years confused with the following species. It occurs in the South Tirol.

3. *GRYLOMORPHA LONGICAUDA*, Rambur.

Differs from the preceding in its chestnut colour with yellow spots; the subanal plate of the male is truncate posteriorly with the posterior angles prolonged into pointed lobes. Length of body, 15mm. ♂, 17mm. ♀; of pronotum, 2.2mm. ♂, 3mm. ♀; of ovipositor, 17mm. ♀.

Southern Spain: Chiclana.

Family IV: *MYRMECOPHILIDÆ*.

This family contains a few curious little crickets which inhabit ants' nests in Europe, Asia and America.

Genus I: *MYRMECOPHILA*, Latr.

Minute, oval, convex, apterous crickets; eyes abortive; thick antennæ; exceedingly thick hind femora; ovipositor short; abdomen short and broad.

The members of this genus are easy to recognise by their habitat and their remarkable form, and minute size.

TABLE OF SPECIES.

1. Body depressed, reddish-chestnut, opaque; pro- and mesonota with pale hinder border 1. *ACERVORUM*, Panzer.

1.1. Body convex, ochraceous, shining; pro- and mesonotum smooth 2. OCHRACEA, Fisch.

1. MYRMECOPHILA ACERVORUM, Panzer.

Length of body, 3.5mm. ♀; breadth of body, 2mm. ♀; ♂ unknown.

Occurs as a guest in nests of various species of ants under stones in many parts of Europe. In France, recorded from Seres, near Paris, Montmorency, Montpellier, Hyères, Bregançon, and Zormes. In Germany from Berlin, Halle, Thüringen, and Pirna in Saxony. In Italy at Pisa. Unknown in Switzerland and South Germany; doubtfully recorded from England (Salop). In Spain and Valencia, Alicante, Cartagena, Algeciras. In Bohemia, and in Austria, at Mödling near Vienna, Anninger Prater and Brück. In Middle Europe it is found with *Formica fusca*, *F. sanguinea*, *Lasius niger*, *Myrmica laevinodis*, *Tetramorium caespitum*: in southern Europe and North Africa with *Aphaenogaster testaceopilosa*, *Camponotus lateralis* and *C. dichrous*. A variety of this species is recorded from India with *Bothroponera sulcata*, and the var. *flavocincta*, Wasm., is found with *Plagiolepis longipes*.

2. MYRMECOPHILA OCHRACEA, Fischer.

Length of body, 2.8mm. ♀; breadth, 1.8mm. ♀.

A south-eastern species recorded from Sicily. It has been taken in nests of *Aphaenogaster barbara*, and its very young larvæ with *Phidole pallidula*. An almost indistinguishable species occurs also in North America.

Family V: MOGOPLISTIDÆ.

This family contains a few small delicate elongate crickets, of purely southern distribution, characterised by the armature of the hind tibiæ, which have only a fine serrulation instead of spines; the European species are apterous; the bodies are clothed with minute scales like those of butterflies.

TABLE OF GENERA.

1. Face with a tumid elevation which is not furrowed..	1. MOGOPLISTUS, Sauss.
1.1. Tumid elevation of face deeply furrowed	2. ARACHNOCEPHALUS, Costa.

Genus I: MOGOPLISTUS, Sauss.

Antennæ very slender, not twice as long as the body.

TABLE OF SPECIES.

1. Testaceous; pronotum shorter than long; subgenital plate of ♂ very broad	1. SQUAMIGER, Fisch.
1.1. Chestnut; pronotum longer than broad; subgenital plate ♂ narrow..	2. BRUNNEUS, Serv.

1. MOGOPLISTUS SQUAMIGER, Fischer.

Length of body, 9mm. ♂, 12mm. ♀; of pronotum, 2mm. ♂, 2.5mm. ♀; of ovipositor, 6mm. ♀.

Under stones, along the coast, in South Europe. In France at Hyères and Fréjus. In Italy at Ischia. In Spain at Valencia and Mascalat.

2. MOGOPLISTUS BRUNNEUS, Serville.

Somewhat smaller than the last and darker in colour. Length of body, 6.5mm. ♂, 8mm. ♀; of pronotum, 2mm. ♂, 3mm. ♀; of ovipositor, 2.3mm. ♀.

In July under dry leaves in Southern Europe. In France at Draguignan, Nice, and Aix; in Sardinia. In Italy at Naples and in Sicily. In Spain at Seville, Montserrat and Barcelona.

Genus II: ARACHNOCEPHALUS, Costa.

Antennæ slender, 3 times as long as the body.

TABLE OF SPECIES.

1. Larger; head and pronotum lurid	1. YERSINII, Sauss.
1.1. Smaller; head and pronotum greyish (occurs in Italy)	2. VESTITUS, Costa.

1. ARACHNOCEPHALUS YERSINII, Sauss.

Ovipositor straight; pronotum parallel. Length of body, 8.5mm. ♂ and ♀; of pronotum, 1.6mm. ♂ and ♀; of ovipositor, 5.1mm. ♀.

On small shrubs, grass, etc., in hot, stony or damp places in autumn. Southern France: Hyères, Cannes, Saint Raphael, Île de Porquerolles, Bagnols, Nice, Draguignan. In Italy at Pegli: in Spain, Bolivar discovered it sucking the juice of elms in the Casa de Campo near Madrid, in August.

2. ARACHNOCEPHALUS VESTITUS, Costa (=dalmatinus, Sauss.)

Ovipositor curved; pronotum narrow in front. Length of body, 6.5mm. ♂, 8mm. ♀; of pronotum, 1.8mm. ♂, 2mm. ♀; of ovipositor, 5.5mm. ♀; under dead leaves and on flowers: a south-eastern species recorded from Naples.

Family VI: GRYLLOTALPIDÆ.

This family comprises the mole crickets, which have an exceedingly wide distribution through the world, but differ little in appearance and structure. The head is small, the pronotum ample, oval with rounded sides; the ovipositor is not exserted; the most remarkable modification is that of the front legs, which are compressed and very powerful, admirably adapted for digging. The elytra are oval, the wings generally long and caudate.

Genus I: GRYLLOTALPA, Latr.

A single European species.

1. GRYLLOTALPA GRYLLOTALPA, Linn. (=rulyaris, Latr.).

Large and powerful, chocolate-brown; wings long and caudate, very rarely abbreviated. There is little difference in the venation of the elytra in the two sexes, and probably the female chirps too. Length of body, 35mm.-50mm. ♂ and ♀; of pronotum, 13mm.-16mm. ♂ and ♀; of elytra, 14mm.-20mm. ♂ and ♀.

Occurs throughout Europe and from Sweden to Spain; in England rare, and local; New Forest, Isle of Wight, Selborne, etc.; in France, abundant, often doing damage to gardens by destroying roots in its subterranean burrows. In Sweden at Landskrona, Rösjeholm, Halland, Calmar, St. Röi, and Bleking. Common in Belgium. The rare var. *cophta*, Haan, with abbreviated wings, is recorded from Brindisi.

Family VII: TRIDACTYLIDÆ.

This family includes a number of species which look like minute mole-crickets; like them, the ovipositor is wanting, the fore-legs are fossorial and the head and pronotum have the same form. But they differ in their minute size and short 10-segmented antennæ; the tarsi are abortive; the anal segment in both sexes has four hairy appendages.

Genus I: TRIDACTYLUS, Latr. (= *Xya*, Illiger).

1. TRIDACTYLUS VARIEGATUS, Latr.

Minute: elytra shining, wings caudate; shining bronze with whitish markings. Length of body, 6mm. ♂ and ♀; of ovipositor; of pronotum 1.8mm. ♂ and ♀; of elytra, 2mm. ♂ and ♀.

The arrangement of the whitish markings varies considerably but the white border of the pronotum is constant. Common and widely distributed; occurs on fine sand by the shores of rivers and lakes, where it digs galleries; it is adult in July and August throughout Southern Europe. In France on the banks of the Rhone as far north as Lyons; the banks of the Adour, Vias, Cannes, Antibes, Nice, Digne, Saint-Sever, Juan-les-Pins. In Switzerland at the junction of the Rhone and the Arve; in Italy at Spezzia and Benvenuto in the south; Tirol and Bozen and centre and south of Spain and Portugal; eastwards it extends far into Asia.

List of Lepidoptera captured recently in Rossshire.

By DOROTHY J. JACKSON.

(Continued from p. 117).

NOCTUOIDES.—*Triaena psi*, Swordale, larva beaten from lime, September 10th, 1906. *Pharetra ruminis*, Swordale, common, larva, July 4th, 1908. *P. menyanthidis*, Swordale, common, larva, August 26th, 1906. *Arctomycesis myricae*, Swordale, larva, August 16th, 1906. *Leucania lithargyria*, Swordale, August 7th, 1908. *L. pallens*, Swordale, larva swept from long grass, June 17th, 1908, imago emerged, July 31st, 1908. *Tapinostola fulra*, Swordale, imago flying by day, September 19th, 1908; Fortrose taken at sugar, September 26th, 1908; imago beaten from sea-campion on sea cliff, Wallago near Wick, September 12th, 1908. *Hydrocacia nictitans*, Swordale, common, imago resting on thistle-head, August 30th, 1908; Nigg, taken on ragwort, September 17th, 1908; Fortrose, September 24th, 1908. *Hydrocacia micacea*, common near the sea; Nigg, imago feasting on ragwort, September 17th, 1908; Fortrose, imago flying by day, September 25th, 1908. *Xylophasia rurea*, Swordale, common, imago beaten from a chestnut-tree, June 27th, 1908, flying at dusk, July 3rd, 1908. *Xylophasia monoglypha*, Swordale, common, imago, July 19th, 1908; Nigg, taken at sugar, September 17th, 1908. *Charaeas graminis*, Swordale, common, larva (fullfed), June 17th, 1908, imago, August 20th, 1908. *Luperina testacea*, Swordale, pupa found under a stone close to the sea, August 28th, 1908, imago emerged, September 13th, 1908. *Mamestra brassicae*, Swordale, common, larva, September 15th, 1906. *Apamea basilinea*, Swordale, imago, July 2nd, 1908. *A. gemina*, Swordale, common, imago, June 25th, 1908; Stirkoke, Wick, imago beginning of July, 1908. *A. didyma*, Swordale, common, imago, August 15th, 1906, August 6th, 1907. *Miana fasciuncula*, Swordale, imago resting on head of an Umbellifer, July 20th, 1908. *M. literosa*, Swordale, imago beaten from bush near the sea, August 27th, 1907. *Celaena haworthii*, Swordale, common, imago feeding on ragwort, September 20th, 1908; a rather large brightly-coloured specimen swept up from herbage in a bog at Kinraig, Invergordon, August 18th, 1908. *Stilbia anomala*, Swordale, taken at light, August, 1907. *Caradrina quadripunctata*,

Swordale, abundant; Stirkoke, Wick, imago, September 8th, 1908. *Peridroma ypsilon*, Swordale, fairly common, September 29th, 1908; Fortrose, September 24th, 1908 (imago). *P. saucia*, Swordale, taken at sugar, September 19th, 1908. *Agrotis exclamationis*, Swordale, flying wildly in sunshine over a field, June 27th, 1908. *A. ayathina*, Swordale, common, larva swept up from heather, May 9th, 1908; several moths taken at the lighthouse, Tarbat Ness, during summer, 1908; *Agrotis simulans*, taken at light, Tarbat Ness lighthouse, summer, 1908. *Lycophotia strigula*, Swordale, common; Edderton, July 2nd, 1908 (imago); Stirkoke, Wick, larvæ, September 27th, 1907. *Actebia praecox*, taken at light, Tarbat Ness lighthouse, summer, 1908. *Graphiphora augur*, Swordale, common, imago, July 19th, 1908; larva, May 10th, 1908. *Noctua glareosa*, Swordale, fairly common, imago feasting on ragwort by day, September 20th, 1908; Tarbat Ness lighthouse, summer, 1908. *N. depuncta*, Swordale, larva, May 5th, 1908, feeding on primrose; imago emerged August 3rd, 1908. *N. plecta*, Swordale, imago reared, June 27th, 1908. *N. triangulum*, Swordale, common, larva, April 7th, 1907. *N. brunnea*, Swordale, common, larva, May 6th, 1908. *N. festiva*, Swordale, common. *N. dahlii*, Swordale, imago reared, July 25th, 1908. *N. rubi*, Swordale, common, larva, May 4th, 1908. *N. baja*, Swordale, fairly common, larva, May, 5th, 1908. *N. xanthographa*, Swordale, common, taken on ragwort in the daytime, September 20th, 1908; Nigg, taken at sugar, September 17th, 1908; Fortrose, September 25th, 1908; Stirkoke, Wick, imago taken at light, September 5th, 1908. *Triphaena janthina*, Swordale, common, larva, May 11th, 1908; imago reared, July 17th, 1908; Stirkoke, Wick, imago taken at light, September 5th, 1908. *T. jimbria*, Swordale, common, larva, May 6th, 1908; Fortrose, imago taken at sugar, September 24th, 1908. *T. comes*, Swordale, fairly common, larva, May 10th, 1908, imago taken at sugar, September 18th, 1908. *T. pronuba*, Swordale, very common, imago, September 18th, 1908; feasting on ragwort by day, September 20th, 1908; Fortrose, September 24th, 1908; Stirkoke, Wick, September 6th, 1908. *Amphipyra tragopoginis*, common, Swordale, imago, September 18th, 1908; taken on ragwort by day, September 20th, 1908; Nigg, September 17th, 1908; Fortrose, September 24th, 1908; larva, Balmacara, West Ross, June 16th, 1907. *Naenia typica*, Swordale, larva found beneath some dock leaves, May 16th, 1908, imago emerged, July 21st, 1908. *Panolis piniperda*, Swordale, common, larva, June 30th, 1907. *Taeniocampa gothica*, Swordale, common, larva, August 7th, 1906, imago reared, May 6th, 1908; Loch Maree, larva, June 2nd, 1908. *T. incerta*, Swordale, common, larva, June 27th, 1908; Falls of Conon, Strathpeffer, July 18th, 1908; Balmacara, West Ross, larva, June 17th, 1907. *T. stabilis*, Swordale, common, larva, June 9th, 1908: Falls of Conon, Strathpeffer, July 18th, 1908. *Orthosia lota*, Swordale, larva beaten from sallow, June 8th, 1907, imago reared, October 4th, 1907. *O. macilenta*, Swordale, fairly common, larva beaten from whitethorn, May 13th, 1908, imago taken at sugar, September 18th, 1908; Fortrose, September 26th, 1908. *Anchocelis rufina*, Swordale, fairly common, imago taken at sugar, September 20th, 1908. *A. litura*, Swordale, abundant, imago, September 18th, 1908; Nigg, September 17th, 1908; Fortrose, September 24th, 1908; Balmacara, West Ross, larva, June 15th, 1907. *Cerastis*

raecinii, Swordale, fairly common, Fortrose, imago, September 25th, 1908. *Scopelosoma satellitia*, Swordale, common, larva, June 6th, 1908; Fortrose, imago taken at sugar, September 25th, 1908. *Xanthia fulvago*, Swordale, common, imago reared, August 16th, 1907; *Xanthia flarago*, Swordale, fairly common, imago beaten from a birch bush amongst a shower of autumn leaves with which its colour harmonized very beautifully, August 31st, 1908; Stirkoke, Wick, imago taken at heather bloom, September 13th, 1908. *Mellinia circellaris*, Swordale, common, imago, September 18th, 1908; Fortrose, September 24th, 1908. *M. gilvago* is fairly common. *Calymnia trapezina*, Swordale, common, larva. June 6th, 1908, imagines beaten from beech and oak, September 1st, 1908; taken at sugar, Nigg, September 17th, 1908; larva beaten from oak, Balmacara, June 17th, 1907. *Polia chi*, Swordale, common, larva, June 18th, 1908, imago, August 28th, 1908; Fortrose, taken at sugar, September 26th, 1908; Balmacara, larva, June 15th, 1907. *Dasyphilia templi*, Noss Head, Wick, thirty-six specimens taken at light in October, 1908; several more taken at Tarbat Ness lighthouse, October, 1908. *Dianthoecia cucubali*, Swordale, common, larva feeding on seabious leaves, August 23rd, 1906; feeding in the seed-vessels of ragged robin (very young), August 21st, 1907. *Epunda lutulenta*, two specimens taken at light, Tarbat Ness lighthouse, during summer, 1908; Swordale, imago taken on ragwort by day, September 14th, 1908. *Epunda nigra*, Swordale, common, imago taken at sugar, September 19th, 1908; Fortrose, September 26th, 1908; Nigg, September 17th, 1908; taken at light, Noss Head, Wick, September, 1908. *Cleoceris criminalis*, Swordale, fairly common, larva, June 25th, 1908. *Miselia oxyacanthae*, Swordale, common, larva, May 17th, 1908, imago taken at sugar, September 21st, 1908; Fortrose, September 24th, 1908. *Agriopsis aprilina*, Swordale, common, larva, June 6th, 1908, imago taken at sugar, September 28th, 1908; Balmacara, West Ross, larva beaten from oak, June 17th, 1907. *Euplexia lucipara*, Swordale, larva beaten from sallow, August 20th, 1906. *Phlogophora meticulosa*, imago taken at light, Tarbat Ness lighthouse, September, 1908. *Aplecta prasina*, Swordale, larva, April 9th, 1907, imago reared (forced), June 9th, 1907. *A. tineta*, larvæ swept up from dwarf birches, Falls of Conon, Strathpeffer, October 3rd, 1908. *Hadena adusta*, Swordale, common, larva, September 30th, 1908. *H. protea*, Swordale, common, larva, June 9th, 1908, imago reared August 2nd, 1908. *H. glauca*, Swordale, common, larva, August 24th, 1906. *H. oleracea*, Swordale, common, imago reared, June 27th, 1908; Nigg, larva, September 16th, 1908. *H. pisi*, Dornoch, two larvæ stretched out at full length and sunning themselves in a very conspicuous manner on the heather, September 26th, 1906. *H. thalassina*, Swordale, imago taken at light, June 9th, 1908. *Hyppa rectilinea*, Swordale, June, 1907. *Calocampa retusa*, Swordale, common, September 18th, 1908; Fortrose, September 25th, 1908; Kyle of Loch Alsh, larva, June 14th, 1907; Noss Head, Wick, taken at light, autumn, 1908. *C. eosoleta*, Swordale, common, imago, September 29th, 1908; taken at sugar, Fortrose, September 28th, 1908. *Gonoptera libatrix*, Swordale, fairly common, larvæ beaten from willow, July 17th, 1907. *Habrostola tripartita*, Swordale, common, imago beaten from an oak-tree to fly wildly before settling on the ground, June 27th, 1908. *Plusia chrysitis*, Swordale, common, larvæ feeding

on comfrey, May 25th, 1908. *P. bractea*, Swordale, not very common, imago taken at light, August 18th, 1908. *P. festucae*, Balmacara, West Ross, cocoon spun amongst rushes found in a marshy piece of land, June 15th, 1907, imago emerged, July 5th, 1907. *P. pulchrina*, Swordale, common, imago emerged, July 11th, 1908. *P. gamma*, Swordale, abundant, numbers taken at Tarbat Ness lighthouse, and also a few at Noss Head, Wick. *P. interrogationis*, Swordale, fairly common, imago, August 4th, 1907. *Anarta myrtilli*, Swordale, larva, August 17th, 1906. *Phytometra viridaria*, imago taken at Glen Elg, Invernessshire, in the beginning of June, 1905. *Euclidia mi*, one specimen taken at Balmacara, June 11th, 1905, another at Duart Castle, Mull, June 16th, 1906, another at Ben Ledi, Perthshire, June 26th, 1906.

DELTOIDES :—*Hypena proboscidalis*, Swordale, common, larva, May 25th, 1908, imago reared, July 7th, 1908, Balmacara, larva May 15th, 1907.

GEOMETRIDES.—*Epione apiciaria*, Swordale, not very common, imago August 31st, 1908; frequenting boggy districts where sallow is common. *Rumia lunulata*, Swordale, abundant, larva, May 18th, 1908; Dornoch, larva September 26th, 1906; Stirkoke, Wick, September 7th, 1908. *Metrocampa margaritaria*, Swordale, common, larva, May 16th, 1908; Falls of Conon, imago July 18th, 1908, ♀, laid eggs which emerged August 6th, 1908; Loch Maree, larva, June 2nd, 1908; Dornoch, larvæ, September 26th, 1906. *Elloptia prosapiaria*, Swordale, common, imago, August 2nd, 1908. *Selenia bilunaria*, Swordale, common, larva, August 27th, 1907, imago reared May 7th, 1908; Stirkoke, Wick, larva, September 7th, 1908. *S. lunaria*, Swordale, larva beaten from birch, September 10th, 1907; two ♀s resting on grass by the Firth, June 18th, 1908. *Odontopera bidentata*, Swordale, common, imago, June 21st, 1908, larva, Falls of Conon, July 18th, 1908; Dornoch, larva, September 26th, 1906; Stirkoke, Wick, larvæ, September 7th, 1908. *Crocallis elinguaria*, Swordale, not very common, larvæ swept up from heather, May, 7th, 1908. *Eugenia alniaria*, very local, rather common in a bog (Kinraig, Invergordon) where a number of larvæ were beaten from alder, July 24th, 1908, imagines emerged September 15th, 1908, etc. *Himera pennaria*, Swordale, common, larva, June 6th, 1908, imago emerged September 2nd, 1908; Loch Maree, larva, June 2nd, 1908. *Phigalia pedaria*, Swordale, common, larva, May 21st, 1908; Loch Maree, larva, June 2nd, 1908; Balmacara, West Ross, June 15th, 1907. *Biston hirtaria*, fairly common, Falls of Conon, Strathpeffer, July 18th, 1908 (larva); Kilmorake Falls, Beauly, larva, July 4th, 1908. *Amphidasys betularia*, Swordale, common, larvæ, September 4th, 1908; Conon Falls, Strathpeffer, October 3rd, 1908; Fortrose, larva, September 25th, 1908; Dornoch (larva), September 28th, 1907. *Cleora lichenaria*, Swordale, larva beaten from a lichen-covered hawthorn, July 9th, 1907. *Boarmia repandata*, Swordale, common, larvæ feeding on blaeberry, heather, and flowers of whin, May 7th, 1908, imago reared, July 6th, 1908. *Tephrosia bistortata* (*crepuscularia*), Swordale, fairly common, Kilmorack Falls, Beauly, July 4th, 1908. *T. punctularia*, very local, but quite common at the Falls of Conon, Strathpeffer, where several moths were beaten from the birch bushes on May 30th, 1908, and a lot of larvæ on July 18th, 1908. *Geometra papilionaria*, one larva beaten from birch, Rogie Falls, Strathpeffer, September 6th, 1908, and

another at the Conon Falls, October 3rd, 1908. *Zonosoma pendularia*, Swordale, fairly common, larva, September 9th, 1907; Falls of Conon, imago, May 30th, 1908; Dornoch, larva, September 27th, 1906. *Venusia cambrica*, Swordale, not common, imago, July, 1906. *Acidalia aversata*, Swordale, fairly common, imago, August 21st, 1907, laid eggs which hatched September 18th, 1907, larvæ full-fed in May, 1908, first imago appeared July 24th, 1908. *Cabera pusaria*, Swordale, common, imago, June 11th, 1908; Loch Maree, June 2nd, 1908; Dornoch, larvæ, September 26th, 1906. *C. evanthemaria*, Swordale, common, imago, June 23rd, 1908; Stirkoke, Wick, larva, September 29th, 1907. *Macaria liturata*, Swordale, imago, July 21st, 1907; Dornoch, larva, September 26th, 1906. *Halia vanaria*, Nigg, imago resting on cottage wall, July 29th, 1907. *Panayra petraria*, very local, several moths flying amongst bracken, Falls of Conon, May 30th, 1908. *Numeria pulveraria*, Swordale, larva, September 1st, 1906, beaten from hazel. *Scodionia belgariaria*, Swordale, imago resting on bare peat, July 13th, 1907. *Fidonia carbonaria*, Swordale, one moth, ♀, resting on heather, May 12th, 1906. *Ematurga atomaria*, Swordale, abundant, imago, May 26th, 1908-June 30th, 1908; Loch Maree, June 2nd, 1908; Kyle of Loch Alsh, June 14th, 1907. *Bupalus piniaria*, Swordale, abundant, imago, May 31st, 1908; Loch Maree, imago, June 2nd, 1908; larva, Dornoch, September 26th, 1906; Stirkoke, Wick, September 28th, 1907 (larvæ). *Lomaspilis marginata*, Swordale, very common, imago, June 20th, 1908. *Hybneria rupicararia*, Swordale, common, larvæ beaten from whitethorn, June 20th, 1907. *H. aurantiaria*, Swordale, imago, October 4th, 1908, ♂, ♀ November 3rd, 1908; Falls of Conon, ♂, beaten from birch, October 3rd, 1908; taken at Tarbat Ness lighthouse, October 1908. *H. marginaria*, Swordale, common, larva, June 1st, 1908; Loch Maree, larva, June 2nd, 1908. *H. defoliaria*, Swordale, common, larva, June 6th, 1908, ♂ reared, October 8th, 1908, ♀, November 14th, 1908; Tarbat Ness lighthouse, December 23rd, 1907; Balmacara, larvæ, June 17th, 1907; Loch Maree, larvæ, June 2nd, 1908. *Anisopteryx aescularia*, Swordale, common, larva beaten from elm and hazel, June 18th, 1907. *Cheimatobia brumata*, Swordale, abundant, larvæ, May 11th, 1908, imago, October 21st, 1908; larvæ feeding on bog-myrtle on a small island in Loch Maree, June 2nd, 1908. *Oporabia dilutata*, Swordale, abundant, larva, May 11th, 1908; imago, Fortrose, September 25th, 1908; Falls of Conon, October 3rd, 1908; Loch Maree, larva, June 2nd, 1908; Balmacara larvæ, June 17th, 1907. *Larentia didymata*, Swordale, abundant, larvæ feeding on primrose, May 10th, 1907; Kyle of Loch Alsh, June 14th, 1907 (larva). *L. multistriaria*, Swordale, common, imago, March 5th, 1906. *L. caesiata*, Swordale, very common, larva, May 10th, 1908, imago, July 7th, 1908. *L. salicata*, Swordale, flying amongst heather by a mountain burn, June 26th, 1908; flying in mist and rain at an elevation of about 2500 feet, Ben Wyvis, July 16th, 1908. *L. olivata*, Swordale, common, but rather local, fond of hiding in bushes, such as whin growing on over-hanging banks of mountain-burns, and very readily disturbed, August 11th, 1908. *L. viridaria*, Swordale, common, imago, June 14th, 1908. *Emmelesia affinitata*, Swordale, larva, September 2nd, 1907, reared June 16th, 1908. *E. alchemillata*, Swordale, fairly common, larva, August 30th, 1906. *E. albulata*, Swordale, larva, August 21st

1907. *Eupithecia pulchellata*, Swordale, common, larvæ, August 1st, 1907. *E. oblongata*, Brora, Sutherland, larvæ feeding on ragwort, September 25th, 1907, began to emerge, June 18th, 1908. *E. subfulrata*, Swordale, October 25th, 1907 (larvæ); [Invershin, Sutherland, larvæ, October 26th, 1907.] *E. helvetica*, Swordale, larva beaten from juniper, September 9th, 1906. *E. satyrata*, Swordale, imago, June 14th, 1908. *Eupithecia trisignaria*, Swordale, larva, September 27th, 1908; Fortrose, several larvæ feeding on *Angelica sylvestris* (seeds), September 26th, 1908. *E. fraxinata*, Swordale, larva, September 11th, 1907; Nigg, larva, September 18th, 1908; Stirkoke, Wick, larva beaten from ash, September 11th, 1908. *E. nanata*, Swordale, common, imago, June 14th, 1908. *E. rulgata*, Swordale, common, imago reared, May 7th, 1908. *E. absinthiata*, Swordale, larvæ common, September 24th, 1907; Brora, larva, September 25th, 1907. *E. assimilata*, Swordale, larva feeding on black-currant, July 17th, 1907, imago emerged, August 23rd, 1907. *E. tenuiata*, Swordale, common, larva, May 4th, 1908, imago reared, July 21st, 1908, beaten in numbers from sallow, August 9th, 1908. *E. lariciata*, Swordale, larvæ common, September 9th, 1906; Dornoch, larva, September 26th, 1906. *E. abbreviata*, Swordale, common, larvæ beaten from oak, June 27th, 1908; Balmacara, larva, June 17th, 1907. *E. sobrinata*, Swordale, common, imago, August 29th, 1907. *E. togata*, Swordale, common, larvæ, August 23rd, 1907. *E. pumilata*, Swordale, larvæ feeding on blossoms of cross-leaved heath, July 24th, 1908; Falls of Conon, larvæ, July 18th, 1908. *E. rectangulata*, Swordale, larvæ feeding in blossoms of apple, May 16th, 1908.

(To be continued.)

The Darwin Commemoration—Thoughts—Species.

The present week (June 22nd-26th) brings us face to face with the "Darwin Commemoration at Cambridge," and one of our two famous Universities is celebrating the "Centenary" of Darwin's birth and the "Jubilee" of the publication of his epoch-making work, *The Origin of Species by means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, a work that has largely changed the whole trend of human thought during the last half century. Cambridge University is, during the present week, entertaining scientific men from all parts of the world, in honour of the memory and work of this, one of her greatest sons—greatest one would have said, were it not that Newton also acknowledged Cambridge as his University. What Newton did to bring the laws governing matter within the understanding of the human intellect, Darwin did with the laws governing life. The order of Commemoration is officially announced as follows:—

Tuesday, June 22nd, 8.30 p.m. to 11 p.m.—Reception of delegates and invited guests by the Chancellor of the University, Lord Rayleigh, O.M., F.R.S., Sc. D., in the Fitzwilliam Museum.

Wednesday, 10.30 a.m.—Presentation of addresses in the Senate House by delegates of universities, colleges, academies, and learned societies.

2.30 to 3.45 p.m.—Visit to colleges.

4 to 6 p.m.—Garden party in the grounds of Christ's College. Charles Darwin's rooms open to visitors.

7 p.m.—Banquet in the new Examination Hall.

10 to 12 p.m.—Masters and Fellows "At Home" in Pembroke College Hall and gardens.

Thursday, 11 a.m.—Conferment of honorary degrees in the Senate House.

12 noon.—Rede Lecture by Sir Archibald Geikie, F.R.S., on "Darwin as a Geologist."

3 to 5.30 p.m.—Garden party by Mr. William Erasmus Darwin, Sir George and Lady Darwin, Mr. Francis and Misses Frances Darwin, Mrs. Litchfield, and Miss Darwin, in the Fellows' Garden, Trinity College.

During the celebration there will be an exhibition of portraits, books, and other objects of interest connected with the great naturalist.

It is not our intention to speak of the immense influence Darwin's writings have had on entomology, as on every other branch of science, and every phase of human thought; suffice it to say that the group of animals which we study has provided, more than any other, the material which has been used to demonstrate many of the theories that have been advanced in connection with the phenomena of life as well as the subject of the evolution of species by natural selection. But as we were turning over the pages of one of our entomological magazines, a short paragraph caught the eye. It reads as follows:—

"COLEOPTERA AT DOWNS.—We three very young collectors have lately taken, in the parish of Down, six miles from Bromley, Kent, the following beetles, which we believe to be rare, *viz.*, *Licinus silphoides*, *Panagus f-pustulatus*, and *Clytus mysticus*. As this parish is only fifteen miles from London, we have thought that you might think it worth while to insert this little notice in the 'Intelligencer.'"

—FRANCIS, LEONARD, and HORACE DARWIN (*Ent. Wk. Intelligencer*, vi., p. 98, June 25th, 1859).

It will be seen from this that two of the three brilliant sons of Darwin now officially connected with Cambridge University—Sir George Darwin, Mr. Francis Darwin, and Mr. Horace Darwin—were, in 1859, very young collectors, and collectors in the particular branch of zoology that so fascinated their father in his early days. He, as a lad, was a most ardent coleopterist, and the early training that he obtained as a collector of British coleoptera, no doubt stood him in good stead, when, on the voyage of the Beagle, he was laying up those stores of knowledge that afterwards blossomed into the great book of his life, *The Origin of Species by means of Natural Selection*. Continuing our researches in the oldest of our entomological magazines, we came to the conclusion that the position of entomologists with regard to Darwin's epoch-making work, at the time of, and for some time after, its publication, was generally one of antagonism. Dr. Bree, a well-known entomologist of the time (not, however, to be confused with the Rev. Wm. Bree), published a book shortly after its appearance, entitled *Species not Transmutable nor the Result of Secondary Causes, being a Critical Examination of Mr. Darwin's work entitled Origin and Variation of Species*, which, apart from the prejudice exhibited, is a remarkable exposition of his own position. The fact that, in the title of his own book, he misquoted that of Darwin, and evidently got the latter mixed up somehow with that of Wollaston's *On the Variation of Species*, appears very strange, the opinions of the latter author being very different from those of Darwin. Dr. Bree's book was reviewed by Stainton (*Ent. Wk. Intelligencer*, ix., pp. 78-79), and his opinion of Darwin's work may be at least approximately gauged by the following quotation—

Dr. Bree's aim appears to have been to follow Mr. Darwin's arguments chapter by chapter, and to meet assumptions by opposing facts. Occasionally, Mr. Darwin's propositions are held up to ridicule; we believe that this will give great offence to the followers of Mr. Darwin, but is it possible altogether to avoid doing so?

In some cases, Dr. Bree, with the keenest irony, adds no comment of his own, but contents himself with quoting a sentence *verbatim* from Mr. Darwin.

All the authorities who have recently written on the subject are carefully cited in opposition to Mr. Darwin's views, and Agassiz, Owen, and others, are quoted continually in the pages of this volume.

Two paragraphs, anent "blind cave-beetles," are then put into juxtaposition, (1) Darwin's statement thereon, (2) Murray's explanation from the *Edinburgh New Philosophical Journal*: Stainton then adds—

Entomologists generally, we believe, will prefer the quotation from Mr. Murray to that from Mr. Darwin.

But Stainton evidently did not feel that all was right, or that the last word had been said by entomologists on the question of "the origin of species by natural selection," even when some of the facts had been "held up to ridicule," and we find him quoting (*Ent. Weekly Intelligencer*, ix., pp. 199-200; x., pp. 39-40) extracts at length from Dr. Asa Gray's sympathetic paper, "Free Examination of Darwin's Treatise and of its American Reviewers" (*Atlantic Monthly*, 1860) and giving Gray's summarised reasons for "the persistent recurrence of various hypotheses that animals and plants have somehow been derived from others, as gleaned from a study of Darwin's book and a general glance at the then state of the natural sciences." These reasons (*op. cit.*, pp. 39-40) are very well put and are as cogent to-day as when they were formulated. But the theory was evidently still distasteful to our entomological friends, and they fixed on a skit that appeared in *Blackwood's Magazine*, May, 1861, that should keep backsliders in the old path. It appeared in the *Intelligencer*, x., pp. 78-79, and reads as follows:—

THE ORIGIN OF SPECIES.

A New Song.

Have you heard of this question the doctors among,
Whether all things living from a Monad have sprung?
This has lately been said, and it now shall be sung,

Which nobody can deny.

Not one or two ages sufficed for thefeat,
It required a few millions the change to complete;
But now the thing's done and it looks rather neat,

Which nobody can deny.

The original Monad, our great-great grandsire,
To little or nothing at first did aspire;
But at last to have offspring it took a desire,

Which nobody can deny.

The Monad becoming father or mother,
By budding or bursting produced such another;
And shortly there followed a sister or brother,

Which nobody can deny.

But Monad no longer designates them well—
They're a cluster of molecules now, or a cell;
But which of the two, doctors only can tell,

Which nobody can deny.

These beings, increasing, grew buoyant with life,
And each to itself was both husband and wife;
And at first, strange to say, the two lived without strife,

Which nobody can deny.

But such crowding together soon troublesome grew,
And they thought a division of labour would do;
So their sexual system was parted in two,

Which nobody can deny.

Thus Plato supposes that, severed by fate,
Human halves run about each in search of its mate,
Never pleased till they gain their original state,

Which nobody can deny.

Exrescences fast were now trying to shoot;
Some put out a feeler, some put out a foot;
Some set up a mouth, and some struck down a root,
Which nobody can deny.

See, hydras and sponges and star-fishes breed,
And flies, fleas and lobsters in order succeed,
While ichthyo-sauruses follow the lead
Which nobody can deny.

Some, wishing to walk, manufactured a limb;
Some rigged out a fin, with a purpose to swim;
Some opened an eye, some remained dark and dim,
Which nobody can deny.

From reptiles and fishes to birds we ascend,
And quadrupeds next, their dimensions extend,
Till we rise up to monkeys and men—where we end
Which nobody can deny.

Some creatures are bulky, some creatures are small,
As nature sends food for the few or for all;
And the weakest we know ever go to the wall,
Which nobody can deny.

A deer with a neck that is longer by half
Than the rest of its family (try not to laugh),
By stretching and stretching becomes a giraffe,
Which nobody can deny.

The four-footed beast that we now call a whale,
Held his hind legs so close that they grew to a tail,
Which he uses for threshing the sea like a flail,
Which nobody can deny.

A very tall pig, with a very long nose,
Sends forth a proboscis quite down to his toes;
And he then by the name of elephant goes,
Which nobody can deny.

Pouters, tumblers and fantails are from the same source;
The racer and hack may be traced to one horse;
So men were developed from monkeys, of course,
Which nobody can deny.

An ape with a pliable thumb and big brain,
When the gift of the gab he had managed to gain,
As a Lord of Creation established his reign,
Which nobody can deny.

But I'm sadly afraid, if we do not take care,
A relapse to low life may our prospects impair;
So of beastly propensities let us beware,
Which nobody can deny.

Their lofty position our children may lose,
And, reduced to all fours, must then narrow their views
Which would wholly unfit them for filling our shoes,
Which nobody can deny.

Their vertebrae next might be taken away,
When they'd sink to a shell-fish or spider, some day,
Or the pitiful part of a polypus play,
Which nobody can deny.

Thus losing Humanity's nature and name,
And descending through varying stages of shame,
They'd return to the Monad, from which we all came,
Which nobody can deny.

These notes, culled from the only purely entomological magazine of the time, exhibit fairly the negative or opposition state of mind exhibited by many entomologists, a state of mind never really changed in the following half-century by several of our leading systematists. The difference in the position now is only too marked. We have those who are willing to tell us that we are able to see species in the making under our eyes, who see in every form of variation species in the

making, who have discovered subspecies, and are not satisfied with varieties (local races) or aberrations, yet, who cannot point to a single species, illustrations of which were made 200 or 300 years ago, in which a single iota of change has taken place, who believe that species are as artificial elements as genera, and who are willing to cry-down the man who quietly asks for facts instead of froth, and definitions instead of words. The question of species is as unsettled, as uncertain, as elusive as ever. The factors that determine a physiological or structural change, correlated with some external mark, feature, or shade of colour, that usually stands for the specific character, are still as far off as ever. We spend our lives in research, and spending them thus know how little we have done. To the outsider it seems so much, to the worker so little. In the whole lepidopterous fauna of England there is no species of really uncertain limits, nor one in which the peculiar features that stamp it "species" have been altered one iota in at least our entomological historical time, and, although the necessity for some superficial change, due to the exigencies of protection, has, comparatively recently, led to a greater range of variation that we can see and measure, in some species, the elements that mark them "species" remain unchanged. And, in our experimental work, work done in the laboratory, where we are supposed to be copying nature and attempting to unravel here and there one of the many vital elements that go to form the sum total of some organism, by eliminating as far as possible anything happening under the stress of the experiment to other elements, we have reached but a little way. The Mendelians only find in one species a "law" that is upset by the next species experimented upon, and so on through the whole gamut of our work. In becoming ultra-scientific we often forget all about nature, and, after all, it is what is done by nature, under natural conditions, that goes to the making of the species as they exist in nature, and if our plea for more real scientific natural history shall lead to more field observation, and less of the artificial theorising into which we are being more or less unwillingly dragged, we shall get nearer to an understanding of the true nature of species, and an appreciation of the manifold elements that must have accumulated through aeons of time to make the species just what they are now and just what they seem to us.

SCIENTIFIC NOTES AND OBSERVATIONS.

GYNANDROMORPHOUS *SATURNIA PAVONIA*.—I bred a very remarkable example of *Saturnia pavonia* from a Bexley larva, in May last. The right wings and right antenna are quite normal, ♂. The left forewing has the upper half ♀, the lower half ♂, whilst the left hindwing has also the top half ♀, the bottom half ♂, with, however, a few splashes of ♀ colour in this ♂ area. The ocellated spots on the "mixed" side are larger than on the ♂ side. The antenna on the left side is about midway between the sexes. The abdomen is very large, but not so large as that of a normal ♀.—L. W. NEWMAN, F.E.S., Bexley, Kent. June 26th, 1909.

NOTES ON COLLECTING, Etc.

GREAT ABUNDANCE OF LARVÆ OF *HYPONOMEUTA CAGNAGELLUS* IN LEWISHAM.—Last year I remarked (*anteā*, vol. xx., pp. 185, 216) the

occurrence of this species in Lewisham, on *Euonymus japonicus*. I have been on the look-out (without searching) for it again this year, but have never seen a trace of its webs till this morning, when I noticed some of the bushes in the gardens in Torridon Road, almost covered with them. This afternoon I observed that almost every bush in Wisteria Road and Gilmore Road is similarly covered, and the larvæ therein of very considerable size. Of course, they must have been some days reaching their present conspicuous stage, but it seems remarkable that I should not have noticed them before. Their webs are most unsightly, and the species is here fast becoming on their adopted foodplant a veritable plague.—A. M. COCHRANE, Lewisham.
June 10th, 1909.

PHYRXUS LIVORNICA AT CARLISLE.—I have just seen a fine specimen of this moth which was taken at rest in a busy part of Carlisle by Mr. J. R. Dalton, a young and keen collector, on April 26th last.—F. H. DAY, F.E.S., 26, Curock Terrace, Carlisle. May 26th, 1909.

EARLY BROOD OF *AGRIADES CORIDON* ON THE RIVIERA.—Whilst walking from Cavalaire to Le Canadel, some few miles to the east of Hyères, on May 6th, I met at intervals with a fair number of specimens of *A. coridon* of both sexes, the majority being by no means fresh. As I have also taken this species quite fresh, but very small, in the neighbourhood of Florence (which is a little further north) in September, I have no doubt that, in these latitudes, *A. coridon* is not only double- but triple-brooded. These early specimens are of a darker, more leaden, blue than the type, and have the characteristic dark and heavily marked underside of the Riviera race.—GEORGE WHEELER, M.A., F.E.S., Briarfield, Guildford. June 2nd, 1909.

NOTES ON BUTTERFLIES.—*Pyrameis cardui*.—Some years ago my wife found a few larvæ on the top of the Las Vegas Range, New Mexico, at an altitude of a little over 11000 ft. One of these gave an imago, which is unusually small (expanse 54mm.) and dark, the dark colour on the upperside of the hindwings being especially increased and suffused. It does not amount to a distinct aberration, but it shows just the features one might have expected in a specimen from such an altitude. *Argynnis uitocris* var. *nigracaerulea*.—This splendid insect has the least range of any butterfly known to me, amounting apparently to only a few square miles, within which it is very abundant. This is in part of the Sapello Cañon, and in the Rociada valley over the hill, on the slope of the Las Vegas Range, New Mexico. The Rociada locality is now first reported; my wife and I found it there in quantity one August 8th. Other lepidoptera obtained at the same time and place were *Colias eurytheme*, *Ennaessa antiopa*, *Anosia plexippus*, *Nathalis iole*, *Satyrus charon*, *Heliothis armigera*, and *Deilephila lineata*, a very plebeian collection. At Beulah, in the Sapello Cañon, my wife found a magnificent female (ab. *rufescens*, nov.), in which the broad, light marginal areas are strongly suffused with the red colour of the male.—T. D. A. COCKERELL, Boulder, Colorado.

ABUNDANCE OF LEPIDOPTERA AND LEPIDOPTEROUS LARVÆ.—I was much interested in our Editor's note in this month's *Ent. Record* re the abundance of larvæ on oaks, etc. On May 31st, I took out my beating-tray for a day's beating in a locality near here, where probably no entomologist's foot ever strays except my own. I found the oaks fairly cleared of leaves in many instances, and showers of larvæ of

Cheimatobia brumata, *Hybernia defoliaria*, *H. progemmaria*, and *Phigalia pedaria* came down, as well as many *Amphidasys strataria*, whilst *Cosmia trapezina*, *Amphyipyra pyramidea*, *Dryobotia protea*, *Taeniocampa cruda*, *T. miniosa*, etc., were in abundance ; another species obtained was *Cleora lichenaria*, larvæ of which were very numerous on some of the trees. Some oaks had scarcely any larvæ on them except those of *Bithys querci*, but of these I collected over 300 in less than two hours. I have never known larvæ of this species so abundant here during all the years I have collected. A ♂ *Stauropus fagi* came down into the tray, and I found two more at rest on oak-trunks. *Hylephila prasinana* were also not uncommon. I suppose the trees will throw out a second growth of leaves as soon as the larvæ are gone, but many are as bare now as in December ! I would also mention that blackthorns are in many cases denuded of leaves by larvæ that I presume are *Hybernia progemmaria*. Of butterflies, the common whites swarmed, but I have not seen *Leptidia sinapis*, and, although a large number of ♂ *Euchloë cardamines* was noticed, I have neither taken nor seen a ♀ ; *Callophrys rubi* also was very abundant this year. *Venilia maenulata* are out in swarms, whilst, on the moors, *Eupithecia nanata*, *Heliaca arbuti*, and *Anarta myrtilli* are very plentiful. Of the latter species, one morning recently, I came across a number sitting on heather-tops, just freshly-emerged. A sea-fog crept up, and the moths were so lazy that I was able to box them as they sat. The sallows are full of larvæ of *Orthosia lata*, *Hypsipetes clutata*, *Cleoceris riminalis*, besides a host of Tortricids, of which I have no knowledge. At the end of April, larvæ of *Lasiocampa querci* were in numbers in almost every hedge, feeding either on young shoots of *Galium mollugo* or bramble. About three weeks ago, great numbers of *Pyrameis atalanta* put in an appearance suddenly ; the larvæ certainly swarmed on every nettle-patch last September, but whether those about are now hibernated examples from those native larvæ, or whether they are immigrants like *Pyrameis cardui* of a few years back, I am unable to say ; at any rate, they appear just as perfect and as brightly coloured as freshly-emerged or bred insects. *Celastrina argiolus* was very numerous this spring, flying round holly trees, but generally higher up, usually well out of reach.—ERNEST A. ROGERS, Kabul House, Teignmouth. June 15th, 1909.

LEPIDOPTERA IN OXFORDSHIRE AND BERKSHIRE.—I have been collecting very energetically this season, and, during the last week, have been to the Mapledurham beech-woods and taken both sexes of *Stauropus fagi*, *Tephrosia consonaria*, and *Ptilophora plumigera* larvæ, etc. I have also been successful in taking *Melitaea cinxia* in the Isle of Wight. I have worked Burghfield for pine and birch species, with some success, and in the Tubney district captured *Melitaea aurinia*, *Adscita statices*, *Nemeophila plantaginis*, etc. At Birdlip, really a very fine collecting ground, I captured *Adscita geryon*, *Neuronia reticulata*, *Hadena dentina*, and many Geometrids. *Asthenia blomeri* still occurs there, and was taken by a friend, although not falling to my share. In Pamber Forest, I took *Melanippe hastata*, *Minoa murinata*, etc., though *Leptidia sinapis* appears to be rather rare there now. I was indebted to Mr. Holland for an introduction to the “*fagi*” woods, but hard and patient work is necessary to ensure success.—CHARLES MELLOWS, Union Society, Oxford. June 16th, 1909.

ABUNDANCE OF *CUPIDO MINIMUS*.—It would appear that *Cupido minimus*, in common with many other species of butterflies, is very abundant this year. On the afternoon of June 10th, in one of the hot gleams of sunshine that broke through the rain-showers of that day, the species was seen in considerable numbers by the roadside and on the downs behind Winchester, and a few minutes' search discovered plenty of eggs on the flower-heads of *Anthyllis vulneraria*. *Polyommatus icarus*, and *Coenonympha pamphilus* were also common, but the rain prevented any further observation as to what other species were about.—J. W. TUTT.

PYRAMEIS CARDUI AT BEACHY HEAD.—It would appear that, other things being favourable, we may have another *Pyrameis cardui* year. At least, specimens have evidently arrived, two examples, somewhat pale in colour, but otherwise wing-perfect, were flying swiftly in the sun, and in spite of a high wind, round the old lighthouse at Beachy Head, on the afternoon of June 18th, occasionally settling on the flowers of *Lotus corniculatus* that abound just there.—JAMES BELL.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

EGGLAYING OF *NEMEOBIUS LUCINA*.—Perhaps it may be of interest to record that, on June 10th, near here, I found 53 ova of *Nemeobius lucina* on one leaf and 22 on another leaf. Each batch had the ova placed closed together in irregular rows. In all other cases the ova were found in much smaller numbers on each leaf, sometimes two adjoining or singly. The ova were found in a wood in the Woodham Ferris district, Essex. A large number of leaves from different parts of the wood were collected. I discovered the ova while picking the leaves in a small clearing where the primrose plants were few, and I think that all those on which I obtained ova were in clearings. The ground on which the wood is situated is flat and the soil fairly heavy. There was no cowslip, only primrose. Some of the eggs hatched on the 14th inst., and some are still (June 16th) unbatched. All were on the underside of the leaf, and the large batches were laid near the tip of the leaf. The Rev. G. H. Raynor, who was collecting with me, wrote me that he had found 11 on one leaf, which was a record for him.—E. E. BENTALL, F.E.S., The Towers, Heybridge, Essex. *June 16th, 1909.* [Is it possible that the large batches are those of another species?—ED.]

PUPATION OF *DRYAS PAPHIA*.—June 19th, 1909. The larva having been suspended for some days, and remaining, as far as I could see, perfectly quiescent, the only change observed had been the gradual swelling of the thoracic segments; at 8 p.m. on this day, the skin on the back of the thorax split, the opening not extending beyond the thoracic segments. By a series of peristaltic motions, the larval skin was worked backwards; by 8.8 p.m. the process was completed. A series of vigorous wriggles succeeded, and at 8.10 the cast larval skin fell into my hand which I had extended in the expectation of the newly exposed pupæ falling from its anchorage; at 8.12 p.m. the whole process was completed, and the pupa became still. The colour pale clay. The silver spots not quite evident. The double dorsal line of the larva quite plainly visible.—C. R. N. BURROWS, F.E.S., The Vicarage, Mucking, Essex. *June 15th, 1909.*

THE COLOUR-CHANGE OF THE PUPÆ OF *CHRYSOPHANUS DISPAR* VAR. *RUTILUS*.—The beautiful vivid green of the larva of this species is now too

well-known to British collectors to need description. When the larvæ first change to pupæ, the thorax and wings are of a pale, semi-transparent, sage-green, the abdomen of a yellowish-green, and the head and head-parts of a pearly-yellowish (this is so both dorsally and ventrally). In the next stage the ventral area is exceedingly pale greenish-white, the head-parts being rather paler than the wings and legs, whilst the venter of the abdomen round the cremastral area is more bone-coloured, the dorsum in this stage being much darker, of a suffused greyish-green on the thorax, much speckled with fine dark dots; the abdomen of a suffused greenish-yellow, with traces of rather darker oblique subdorsal lines on each segment, the space between the supraspiracular and ventral areas being of the darker and more suffused colour of the thorax, whilst a fine dark mediodorsal line runs the whole length of the dorsum from the frons to the posterior edge. In the next colour-change the paler areas, ventrally and dorsally, become semi-transparent, dirty grey-brown, whilst the darker parts of the dorsum of the thorax, the mediodorsal line, the sides of the abdomen, and the speckling of the dorsum of the abdomen, become dark grey, the five (or six) oblique, subdorsal, abdominal lines, being very pale. In this stage the pupa has much the appearance of a pebble, and, as the larvae pupate quite free from cremastral attachment, and possibly on the ground, the colour is probably of great value, from the point of view of protection. The earliest pupa was found on June 6th, one on June 7th, and three between the afternoon of June 7th and early morning of June 8th. At this time, some of the larvæ sent over were not more than 6mm. long, apparently having moulted once since their hibernation. They were, however, of the same vivid green.—J. W. TUTT, 119, Westcombe Hill, Blackheath, S.E.

CURRENT NOTES.

Dr. D. Sharp notes (*Ent. Mo. Mag.*) seven British species in the genus *Parnus*—*P. prolifericornis*, *P. auriculatus*, Edw., *P. griseus*, *P. luridus*, *P. algiricus*, *P. nitidulus*, and *P. ernesti*, Ganglb. (*auriculatus*, Auct.). He also publishes (*Ent. Mo. Mag.*) a note on *Aphodius niger*, Panzer, pointing out that the name was wrongly introduced by Crotch for *Aphodius plagiatus* ab. *concolor*, but that he has now a ♀ from the New Forest that "answers all the requirements of the insect Erichson referred to *niger*, Panz.," and considers that the species should be reinstated in the Catalogue. The evidence, however, even now is not too satisfying.

Mr. Bagnall adds the following species of Thysanoptera to the British fauna, *viz.*, *Megathrips nobilis* (also new to science) from dried sedge in Wicken Fen, *Cryptothrips dentipes*, Reut., taken at Portmarnock, near Dublin, and in Wicken Fen, *Trichothrips semicaecus*, Uzel, under the bark of a decaying willow at Greatham, near Hartlepool, *T. copiosus*, Uzel, under the bark of a beech tree in Epping Forest, April, 1908.

Mr. A. H. Hamm publishes (*Ent. Mo. Mag.*) some most interesting observations on the pairing of *Empis opaca*, F., from which it appears that the sexes only copulate during sunshine, that the ♂ holds prey in the middle pair of legs (sometimes for a long time before actual copulation), which it transfers to the ♀ at the time of actual pairing, the latter taking place in the air, the two insects settling directly after-

wards, the ♂ hanging by its two anterior legs to a leaf or grass-stem, and supporting the whole weight of the ♀ by means of them. At the moment of uncoupling, the ♀ drops the prey, and the two insects fly off.

We are in receipt of "A Guide to the Natural History of the Isle of Wight,"* a bulky volume of 560 pages, with a number of good illustrations, edited by F. Morey, F.L.S. The various chapters and lists are written and compiled by specialists in their own subjects. There is a considerable amount of difference in the value of the chapters, although most reach a really good standard. Of the insects, the chapter on "Orthoptera" is by Malcolm Burr, B.A., F.Z.S., etc., the Neuroptera by W. J. Lucas, B.A., F.E.S., the Hymenoptera, by Claude Morley, F.E.S., the Coleoptera, by E. A. Newbery, A supplementary list of Coleoptera, by H. St. J. K. Donisthorpe, F.Z.S., F.E.S., Lepidoptera, by Hubert F. Poole, Diptera, by F. Morey, F.L.S., Hemiptera, by E. A. Butler, B.A., B.Sc., F.E.S. The lists are on the whole exceedingly good, and where there is any weakness, the mere fact of putting on record what is known, makes very clear to local workers what yet remains to be done.

There is something unsatisfactory in the tone of some of Mr. Newbery's preliminary remarks on the Coleoptera, and his statement as to "two insects taken in the Island by a member of the Entomological Society" (Mr. Newbery, we presume, means a Fellow of the Entomological Society of London) "and exhibited by him at a meeting of that body" is as remarkable, as it happily is unusual, in connection with a compilation of this description. Mr. Newbery must be wanting in a sense of humour to suppose that, after species have been seen and accepted by the Fellows of the Entomological Society of London, e.g., Mr. Champion, Mr. Donisthorpe, Prof. T. H. Beare, or any other of our leading coleopterists, that they must necessarily be submitted to him before they can be admitted to the fauna of the Isle of Wight, or to a place in the British List. As Mr. Newbery says, "comment is superfluous."

It is not surprising that the editor asked Mr. Donisthorpe to prepare a "Supplementary list of the Coleoptera," and that this list numbers 125 species besides varietal forms, not included in Mr. Newbery's list. The combined lists number 1434 species of Coleoptera. The list of Lepidoptera appears to be an excellent one, as might be expected when we state that Mr. Poole has had the help of Messrs. L. B. Prout and E. R. Banks in its compilation. Considering how little the other orders are worked the lists must be considered very satisfactory, but they show the need of workers in orders other than Coleoptera or Lepidoptera. Every entomologist who goes to the Isle of Wight to spend an entomological holiday will be certainly wasting time if he does not consult this book.

The *Thirty-Second Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society*, 1908, has just come to hand, and, although interesting, appears to be something below the usual standard in bulk and quality of contents. There are brief reports of the meetings held, and a continuation of the "Preliminary Catalogue of the Hemiptera-Homoptera and Hemiptera-Heteroptera," by Oscar

* Published by William Wesley and Son, 28, Essex St., Strand, W.C. Price 8s. 6d. net.

Whittaker, a most useful compilation, but the addition only extends to 4 pages. Added to this, we note that, at the Annual Meeting, there was no Presidential or Vice-Presidential address, a sad omission, considering that the Society boasts a list of Vice-Presidents twice as great as that of the Entomological Society of London, and from one member of which at least some pronouncement on the entomological position, locally or generally, might have been fairly expected.

The Carlisle Natural History is to be congratulated on the issue of the first part of its *Transactions*, and deserves praise not only for the excellence of the contents, but for the first-class style and get-up of the part as a whole, the printing being exceptionally well done. The character of the papers is exceptionally good, and, if maintained, the *Transactions* will hold their own against the publications of the very best natural history societies. Two papers especially claim our attention, (1) "The Butterflies of Cumberland," by G. B. Routledge, F.E.S. (2) "The Coleoptera of Cumberland," pt. i., by F. H. Day, F.E.S. As may be expected, they are both excellent, and written and compiled with a full knowledge of the county fauna. The authorities are given in every case, and in critical cases full reference to the literature. To say more would be superfluous. We shall look forward with interest to the continuation of both these lists. The Anthrocerids, Cochlidids, Lachneids, Attacids, and Sphingids, worked out in detail, would make another excellent group (especially if the geographical side of the variation could be dealt with), but no doubt Mr. Routledge has already got the matter well in hand.

The Rev. C. R. N. Burrows, The Vicarage, Mucking, Essex, who is at work on the genitalia of the Geometrids, asks for ♂s of *Cleora angularia*, *Asthena sylvata*, *Venusia cambrica*, *Acidalia perochraria*, *A. holosericata*, *A. circellata*, *A. straminata*, *A. fumata*, *Fidonia limbaria*, *Scoria lineata*, *Aplasta ononaria*, and *Lythria purpuraria* for examination, specimens British or Continental, condition of no importance, so long as the specimens are quite correctly named, and have not been attacked by mites. Perhaps some of our generous collectors will oblige. Mr. Burrows has now genitalia of the first half of the British species mounted except for these which he would like to complete if he can get the requisite material.

We have just received "The Plumie-Moths of Ceylon, pt. i., The Pterophoridæ," a reprint from *Spolia Zeylanica*, vi., pt. xxi., March, 1909, by T. Bainbrigge-Fletcher, R.N., F.E.S. Considering the state of our ignorance of exotic plumes this paper is really a very remarkable one, and forms, not only an excellent summary of what is known of the "plumes" of Ceylon, but also a basis on which a knowledge of our oriental plumes might very readily be built. In most cases, as may be expected, the only stage of the insect known is the imaginal, but the author has given us a great amount of incidental information on the early stages of some of the species from his own observation. These, however, are, in most cases, essentially facts of œcology, and not structural, as may readily be premised, when one considers the difficulties under which the author carries on his observations, when on duty on board ship. This explains fully why the descriptions of the larvæ and pupæ are often wanting in useful scientific structural details, or even when noted as captured and the imagines bred, not described at all.

This is, in one respect, unfortunate, for Dr. Chapman and Mr. Bacot have already shown (*A Nat. Hist. Brit. Lep.*, vol. v.) that, whilst the reduction of the wing-area, by the formation of the clefts, has, in some instances, apparently reduced to a common type of neuration species that show amazing structural differences in the larval and pupal characters, the latter provide a much more abundant supply of useful characters for the classification and grouping of the species, than the imagines, a fact that Mr. Fletcher has been obliged largely to ignore in his grouping. Falling back mainly on neuration and the structure of the imaginal palpi for his characters, we find him following largely Mr. Meyrick's grouping, already criticised somewhat adversely, owing to its entire omission of any consideration of the characters derived from the early stages, which do not support the imaginal indications.

In the same manner Mr. Fletcher largely follows Mr. Meyrick's names, even when, apparently, proved erroneous, *e.g.*, *Alucita*, Linn. = *Pterophorus*, de Geer, both species having the same type, *pentadactyla*. Does Mr. Fletcher doubt the facts published concerning these, or does he think the facts of no importance? If not, was not the name *Pterophorus* still-born, and is it wise to continue it? Similarly *Trichoptilus* was founded for a group of North American species which we considered not quite the same as the European (and presumably the Asiatic) allies. Is Mr. Fletcher satisfied that the Asiatic and American species cited under the name *Trichoptilus* are identical generically? We ask in all ignorance, it was our opinion that they were not, and Walsingham and Durrant have accepted our view of the matter.

Apart from these criticisms, which must be considered as largely representing the personal equation, and which will come straight when Mr. Fletcher applies close and searching criticism to the facts, we have nothing but praise for Mr. Fletcher's work, splendidly helped by his excellent illustrations. We look forward now to be in the position of being able to hand over the salvation of our "Plume" soul to Mr. Fletcher. We must try to complete our other volume on the British species, just to give the entomological world, as it were, all that has been collected together on the British species of these interesting insects, then we can safely wait till Mr. Fletcher has settled down at home with time to work over again the life-histories of all our British species, and his accumulated foreign material, preserved larvæ, pupal skins, etc., and trust him to bring all that is known of the group into something like order, and make a reputation as the one man in the world who knows something of the plumes of the world. But we must have the characters of the early stages considered before this will be fully conceded. Mr. Fletcher is a born naturalist, and it is as a naturalist and not as a mere museum worker that his work must be judged.

At last, after almost two years' waiting, *The Surrey and Record of Woolwich and West Kent* has been published. It contains "descriptions and records of the Geology, Botany, Zoology, Archaeology, and Industries of the district, with a brief Photographic Commentary," but of these the Botany and Zoology comprise 410 of the 496 pages, so that it will be well-understood that the groups, other than the two last-named, are somewhat meagre. The Zoology, of the section of which Mr. J. W. Tutt was Chairman, and Mr. H. J. Turner, Secretary, occupies from p. 231 to p. 440, and comprises lists of the local Mammals,

Birds, Reptiles, Amphibians, Fishes, False Scorpions, Insects, and Molluscs. The Insects treated of, are the "Hemiptera-Heteroptera" and the "Hemiptera-Homoptera," excellent lists by Mr. W. West; "Odonata," by Mr. S. Edwards; "Coleoptera," by Mr. W. West, another really marvellous list (numbered according to Beare and Donisthorpe's *Catalogue*); "Lepidoptera," excellently compiled by Mr. H. J. Turner, and "Diptera," by Mr. H. W. Andrews. For so small an area as West Kent, the complete list is probably one of the best that has ever been published, extending far beyond the limits of many complete county lists. Few of the best workers in this part of the county have failed to respond to the request of the section for lists, and Mr. H. J. Turner deserves the greatest credit for the enormous amount of successful work that he has been able to put into it. It is a list that should be supported by every entomologist, especially if he be a Man of Kent or Kentish Man.

Many old members of the South London Entomological Society will be pleased to know that Professor T. D. A. Cockerell is now on a visit to England. His address, until September 1st, is Fitzwilliam Museum, Cambridge.

Dr. Hemmerling is publishing an extensive illustrated paper on *Pieris napi* in the current numbers of the *International Ent. Zeitschrift* (Guben); those of our readers interested in this species should make a point of seeing it.

It is with the greatest regret that we have received intelligence of the death of William H. Edwards, the renowned entomologist and naturalist of Coalburgh, Virginia, U.S.A., at the ripe age of 87, on April 4th, last. Probably, with the exception of Scudder, he stands unrivalled as the "naturalist-lepidopterist" of the States, and his quarto volumes on *The Butterflies of North America*, are not only the works of a master of our science, and hence of the highest scientific value, but the illustrations are, in addition, works of art, as accurate as they are beautiful. He had not the marvellous versatility of Scudder, nor the ability to deal in so masterly a way with such a variety of subjects, but his work is equally thorough, and has left its mark on the standard expected of lepidopterists who are also naturalists, in the United States. Indeed, the excellent work of these men, leads us to look rather with contempt on the more recent illustrated work done in the States. Just at present the lepidopterists there are busy amassing, describing, and differentiating the species belonging to the super-families other than butterflies, but recent years have not produced a lepidopterist, who is also a biological naturalist, of the standard of these men. We are almost in a position now to expect some amateur, living in one of the outlying districts of the States, away from the bustle of "cities" and "experimental stations," away from the shibboleths of the State Museums, in whose mind systematic, biologic, and oecologic lepidopterology have their right and proper place, and proper perspective, to work out the life-histories of another group—Sphingids, Arctiids, Lachneids, etc.—in the way that Edwards and Scudder have worked out those of the Papilionids and Urbicolidi. Scattered elements and observations in sundry magazines want collecting, and adding to the newly-worked-out life-histories of the species of these groups, and illustrated in the same excellent way. At present we do not discern on whom the mantle has fallen, but feel assured that it has, or will fall. We are, however, the poorer by the loss of one of

the two greatest naturalist-lepidopterists that America has yet produced.

Our congratulations to Mr. Malcolm Burr, who, on June 23rd, received at the University of Oxford, the degree of D.Sc. for research work in entomology. Mr. Burr has made for himself such a world-wide reputation as an orthopterist of the first rank, that the honour is particularly well-deserved.

Mr. Gillmer describes (*Soc. Ent.*, p. 42) a white aberration (ab. *alba*) of *Geometra papilionaria*, also an ab. *denigrata* of *Larentia lugubrata*, and refers the ab. *nigrescens*, Ckll., of *Eubolia plumbaria*, recorded by Porritt from Yorkshire, to the *luridaria* of Borkhausen (*Naturg.*, v., p. 62).

Mr. Malloch adds the diptera, *Miltogramma germari*, Mg., and *Amaurosoma flaripes*, Fln., to the British list, the former taken "on a sandy path, near Shotover Hill, in which were a number of burrows of various *Aculeata*, on August 7th, 1907," the latter "near Cowley, on May 16th, 1908, by Mr. A. H. Hamm."

It is with great pleasure that we have to record the capture of *Depressaria putrida*, Hb., in Kent. A full account will appear in our September number.

Mr. Newbery adds *Ocyusa defecta*, Muls. et Rey, to the list of British coleoptera. He bases the addition on a single specimen taken by Mr. Rendel among dead leaves in a dry ditch near Tiverton, Devon, in November, 1908. This specimen has been submitted to Capt. Deville, who has compared it with a single specimen taken by himself at Nice. This amount of material for comparison does not appear to be too overwhelming. No doubt Mr. Rendel will get more specimens next November.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 27th, 1909.—EXTREME ABERRATIONS OF *PARARGE EGERIA*.—Dr. Chapman exhibited two very extreme forms of *Pararge egeria*, in which the fulvous areas were much enlarged. They were taken at Amelie-les-Bains. CUCULLIA CHAMOMILLÆ IN LONDON DISTRICT.—Mr. Edwards and Mr. Carr, living specimens of *Cucullia chamomillæ* from south-east London district. TÆNIOCAMPA PULVERULENTA AB. HAGGARTI AT DOVER.—Mr. Smith, a melanic specimen, ab. *haggarti*, of *Tæniocampa pulverulenta (cruda)*, taken at Dover in April. LARVÆ OF *LUCANUS CERVUS*.—Mr. Edwards, larvæ of *Lucanus cervus*, found in some rotting wooden palings on Shooter's Hill. MELANIC SPECIMEN OF *PHRAGMATOBIA FULIGINOSA*.—Mr. Newman, an unusually extreme melanic ♀ of *Phragmatobia fuliginosa*, bred from Sheffield. RARE COLEOPTERA.—Mr. West (Greenwich), specimens of the rare Coccinellid, *Dalyzia 16-guttata*, taken in the New Forest by Mr. Ashby and himself, and a series of *Cassida fastuosa*, taken in some numbers by Mr. H. J. Turner, at Box Hill, on *Inula conyzæ*.

ENTOMOLOGICAL SOCIETY OF LONDON.—June 2nd, 1909.—NORTH AMERICAN SAWFLY IN LONDON.—Mr. Selwyn Image exhibited an example of the North American sawfly, *Sirex caudatus*, Cresson, bred from a larva found at Highbury in a piece of wood, together with photographs of the larva and its galleries by Mr. Hugh Main. RE-DISCOVERED MICRO-LEPIDOPTERON FROM SOUTH OF FRANCE.—Lord Walsingham showed two set examples and pupal cases of *Holocacista*

rivillei, Stn., called by the late Mr. Stainton "The lost Pleiad," because originally described in 1750, and not again found before 1870—mining leaves of the grape vine. The name *Holocacista*, Wlsm. and Drnt., is now proposed for a new genus, Mr. Stainton having placed it in *Antispila*, Tr., from which it is found to differ materially in neuration, suggesting a more probable alliance with *Heliozela*, otherwise *Tinagma*, Stn. RARE BRITISH BEETLE.—Mr. E. C. Bedwell exhibited examples of the myrmecophilous beetle, *Hetaerius ferrugineus*, Ol., from Boxhill, a species not recorded from Britain for 46 years. The species was first captured by Mr. E. W. Janson, in 1848, at Hampstead, with *Formica fusca* and *F. flara*, and again in 1856 (Ent. Annual, 1863, p. 113); it was also recorded in 1863 (Ent. Annual, 1857, p. 77) as having been taken by Dr. Power at Weybridge with *F. rufa*, and by Douglas and Scott near Croydon with *F. sanguinea*. ANTS FROM NORTH BRITAIN.—Mr. H. St. J. Donisthorpe exhibited (a) specimens of *Formica exsecta* (♀ and ♂s), several nests of which he had discovered near Aviemore in Invernessshire in May. He pointed out that it had never been recorded from Scotland or North Britain before, and showed a map of the British Isles to illustrate the British distribution of the species. The localities at present known for it are Aviemore, Bewdley in Worcestershire, New Forest, Parkstone, Bournemouth, as far west as Poole, and as far east as Ringwood, Parkhurst Forest, Isle of Wight, Bovey-Tracey in Devonshire, and the Land's End in Cornwall; also (b) specimens of *F. rufa-pratensis*, ♀s, ♀s, pseudogynes and micrergates from Nethy Bridge, Invernessshire, and remarked that this was the chief form there. He described the nests, and mentioned that a number of them were being extinguished by the undergrowth. Moss starts to grow round the base of the nests, then "bilberry" and heather, which creep upwards all round the hillock, gradually driving the ants to the summit, and eventually extinguishing the colony. Professor Wheeler, in a paper "On Relations of Ants to Plants," records similar cases in America and Europe, and is of opinion that the colony eventually dies off. ABRAXAS *GROSSULARIATA*.—Mr. L. Doncaster exhibited a drawer of *Abra. vas grossulariata* and its var. *lacticolor*, illustrating breeding experiments. The various pairings give the following results:—

- (1) *Lacticolor* ♀ × *grossulariata* ♂, gives offspring all *grossulariata*.
- (2) Heterozygous *grossulariata* ♂ and ♀ paired together, give all ♂s *grossulariata*, ♀s half *grossulariata*, half *lacticolor*.
- (3) *Lacticolor* ♀ × heterozygous *grossulariata* ♂, gives equal proportions of *grossulariata* and *lacticolor* in both sexes. The variety is thus transferred to the male by this pairing.
- (4) The converse pairing heterozygous *grossulariata* ♀ × *lacticolor* ♂, gives all ♂s *grossulariata*, all ♀s *lacticolor*.
- (5) *Lacticolor* ♀ × *lacticolor* ♂, gives only *lacticolor* in both sexes.
- (6) Wild ♀ × *lacticolor* ♂, gives all ♂s *grossulariata*, all ♀s *lacticolor*.

These results show—(1) that *lacticolor* is a Mendelian recessive to *grossulariata*: (2) the converse pairings nos. 1 and 6 above, show that wild ♂s are homozygous (pure) *grossulariata*: but wild ♀s are heterozygous, bearing recessive *lacticolor*. They suggest that the sex-determinants also behave as Mendelian characters, femaleness being dominant, and that ♂s are homozygous in respect of sex, ♀s heterozygous. NEW IRISH BEETLE.—Mr. J. R. Tomlin exhibited examples of *Micropeplus coelatus*, Er., taken on marshy ground last April, near Cloghane, co. Kerry, by Dr. Norman Joy and himself, an interesting

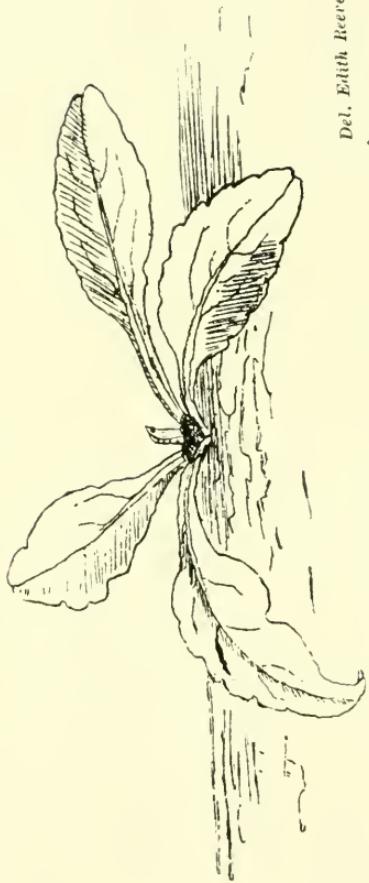
addition to a small genus, so far, reported only from Germany and Sweden. It comes nearest to *M. porcatus*, Payk., from which it is very distinct by its much smaller size, the much feebler raised line on the vertex of the head, the much more rugose sculpture of the head and thorax, and in other points. It has the proportions of *M. tesserula*, Curtis, but is larger, and has the insterstices of the elytra strongly punctured.

A MIGRATION OF LADYBIRDS.—Dr. G. B. Longstaff exhibited a number of specimens of *Coccinella 11-punctata*, L., from the White Nile. On February 16th, 1909, when about 40 miles above Khartûm, numerous lady-birds settled upon the steamer—there were probably many hundreds; they all flew from the east against a slight westerly breeze; the flight lasted from 4.50 p.m. till nearly 6 p.m., all those taken (25) proved to be *Coccinella 11-punctata*, L., a widely-distributed species, and apparently the common lady-bird of Egypt and the Soudan, as Dr. Longstaff met with it near Cairo, at Aswân, at Khartûm, and 125 miles south of that city at El Duwêm on the White Nile. Swarms of lady-birds in England are alluded to by E. C. Rye (*British Beetles*, p. 228); the occurrence of immense swarms of lady-birds on mountains was referred to by Prof. Poulton, quoting Prof. V. L. Kellogg (*Proc. Ent. Soc. Lond.*, 1904, pp. 23 *et seq.*). Kirby and Spence (7th ed., p. 295) mention having personally witnessed *Coccinellae* alight upon a ship at sea. An ARABIAN SCARABAEID IN EGYPT.—Dr. G. B. Longstaff also exhibited a *Scarabaeus* since identified as *S. compressicornis*, Kby., an Arabian species.

A BRAZILIAN CASTNIID MOTH IN DORSET.—Prof. E. B. Poulton exhibited an example of the rare Castniid moth, *Castnia therapon*, Kollar (a Brazilian species), taken flying in his conservatory at Broadstone, Dorest, by Dr. A. R. Wallace, F.R.S. The insect was captured on December 26th, 1908, and the empty pupa-case was found among the roots of a *Stanhopea*, which had been sent to Dr. Wallace from Buenos Ayres.

VARIATION.

CYANIRIS SEMIARGUS AB. INITIA, TUTT.—I have lately taken several examples of *C. semiargus* of a form that I have never yet remarked. The hindwings are provided with an outer margin of white eye-spots, seven or eight of them placed as the marginal spots of *Polyommatus amandus* are, following the curve of the wing. I have already noted a few parallel cases in *Cupido minimus*, and one in *C. sebrus*. This tendency to develop an outer row of spots should be atavistic, and it seems advisable to draw attention to the suggestion. *Glauopsyche melanops* have, very frequently, this outer marginal series in a more or less rudimentary state, but I have never seen a specimen of *G. cyllarus* showing this tendency, indeed, this species appears to me to be very specialised.—P. A. H. MUSCHAMP, F.E.S., Staefa. June 28th, 1909. [This form is described at length in *A Nat. Hist. Brit. Butts.*, x., p. 263, together with various stages of development, until, in var. *persica*, the full Plebeiid spotting is reached. No doubt the oriental form is the older, and the various European and Asiatic races without the marginal series of eyes and lunules, developments therefrom. Mr. Muschamp (and others) will, no doubt, find in our account of the underside spotting of this species (*op. cit.* pp. 259-263) the necessary facts to bear out the suggestion of atavism, in the persistence of the pale marginal spots occurring now aberrationally in ab. *initia*.—ED.]



Del. Edith Reeves.

PUPA OF *FREDERICINA CALODACTYLA* (ZETTERSTEDTI) IN SITU.

Aberration of *Abraxas grossulariata*.

By C. W. SPERRING.

The aberration of *Abraxas grossulariata* figured below was captured during the third week in July, in a garden at Charlton, by Mr. Coppeard, when duskling. The antennae are broken off, and the legs badly set. No yellow appears on the wings, and the pattern of the forewings is not symmetrical. As will be seen by the figure, the forewings are much



more suffused than is usual, even in dark aberrations taken in the London district. It would be interesting to learn whether similar aberrations have been taken wild, of course many such have been bred in past years, and what the range of similar wild-caught aberrations is, especially within the metropolitan area.

Lepidoptera of the Grisons—Zernetz and the Ofen Pass.

By J. W. TUTT, F.E.S.

No British collector of lepidoptera appears to have recorded anything of the fauna of the Ofen Pass district, a wild piece of country lying between Zernetz in the Engadine and the Munster-Thal. It is, however, well-known geologically as comprising an outlying portion of the dolomite mountains, and was bound to produce some useful details as to the geographical distribution of some species if not actually anything new or rare. Time, however, was wanting to do more than examine that section of the road nearer Zernetz, followed up by such chances of collecting as the slownesses and stops of a drive over the Pass finally afforded. Fortunately, the morning of August 12th, 1908, was splendidly sunny, and, after half an hour's walk, the cultivated districts began to be left behind, and insects commenced to appear. The first species of interest was *Polyommatus amandus*, of which a few were seen, but mostly worn, although a ♂ and ♀ were selected that were almost newly-emerged, and that appeared to be of good size, whilst, with them, on the lower part of the same flowery slopes, was a form of *Plebeius argus* (aegon) with good border, which still provided a few good specimens that proved to be var. *killiasi*. With them were *Agriades cordon* and *Hirsutina damon*, both much less abundant here than between Sus and Lavin, a rather large form of *Polyommatus icarus* and *Aricia astrarche*, whilst *Adopaea lineola*, *Coenonympha pamphilus* and other common species were observed, *Adopaea flava* (*thaumas*) and *Heodes virgaureae*, the latter with very yellow ♂'s, were going over. Over the steep stony slopes to the left, an occasional *Parnassius apollo* of large size floated down, the specimens in good

SEPTEMBER 15TH, 1909.

condition, to hang on a *Centaurea* or other flower on the banks below. *Pararge maera*, too, was also frequent, though often badly torn. The two common Pierids—*Pieris brassicae* and *P. rapae*—were still abundant, so also was *P. napi*, but of the most normal form. Higher up, the pine-wood crossed the road, and among the flowers by the roadside, a few worn *Brethis euphrusyne* still flew with plenty of *B. amathusia* and an occasional *B. ino*. A steep flowery bank leading up to the rocks above suggested a halt for a few moments, for here many species were common, *Paruassius apollo* fairly so, although the lower Engadine valleys—at Zernetz, Sus, Lavin—appear to produce this species only very sparingly, several species of blues, *Erebia goante*, captured almost at the commencement of our walk, and other insects, among which *Erebia aethiops* may be mentioned. The best capture here, however, was *Lycaena arion*, two small dull-coloured examples, the ♂ very thinly scaled with blue, the ♀ greyish, with only a tinge of blue scaling towards the basal part of the inner margin. It would be interesting to know if this were the ordinary form of the species in this district, as it is very different from those we have captured in many places elsewhere, at any rate we propose to call it var. (or ab.) *osenia*. Two or three *Aporia crataegi* ♀'s, the central area of the forewings quite glassy and transparent with wear, were observed, and *Argynnis alippe* was frequent. Of the Anthrocerids, only *Anthrocerata lonicerae* and *A. transalpina* were observed, but these were very abundant, the former often with a distinct orange tone in the colour of the hindwings. As one walked along several moths were netted, *Eubolia bipunctaria* being especially abundant, whilst the ♂ *Dasydia obfuscata* were exceptionally large and dark, and this was so throughout the whole length of the Pass, but more interesting to us were examples of *Epione respertaria*, and *Thera obeliscata*, whilst *Lithosia griseola* and *L. liridcola* were very frequent on flowers. The first rocky cutting was much patronised by *Erebia goante*, but one or two worn Erebias netted for inspection were puzzling as being not altogether satisfying for that species, but it was not till a good hour later that we recognised that we had netted among the *E. goante* a worn example or two of the much rarer and local *E. nerine*. But we soon came out on some meadows where mowing was proceeding, and, in one of these, as yet uncut, upon the rank herbage growing round the source of a bubbling spring, *Brethis ino* was very common, although few were worth a pin, and here a pretty pale form of *Eubolia mensuraria* was equally abundant. Worn *Cyaniris semiargus*, too, were not infrequent, but we were evidently much too late for this species in fine condition. Here, too, we captured a magnificent pair of newly-emerged *Melitaea phoebe*, the ♀ of the large dark mountain-valley form, strangely the only examples seen on the Pass. Passing a delightful moss-covered spring where one was tempted to drink, one comes to a bend in the road where a bridge crosses a stream that comes down a side valley and here falls rapidly into the main one. On the banks of the stream, a number of tiny water-rills oozed out, making little wet patches that crossed a track that evidently indicated a short cut to a dwelling higher up the valley, and these damp patches proved most productive, for all the common blues of the valley were assembled here: *Plebeius argus* (*aegon*) var. *killiasi*, worn, *Cyaniris semiargus*, *Hirsutina damon*, *Polyommatus icarus*, *Aricia astrarche*, *Agriades coridon*, and,

unexpectedly, a single *A. bellargus*, with quite a nice lot of *Aricia donzelii* not before noted in the valley, and more sparingly, ♂s of *Polyommatus eros*. On the flower-slopes above the spring just mentioned, one or two ♀ *A. donzelii* were netted, so that the species was evidently quite at home here. Besides *Adopaea lineola*, *Hesperia alveus* was very abundant, and so was *Melampias melampus*, indeed, a very considerable bag was made in this corner in a comparatively short time. Swinging over the bridge the road led through the larches again, and the common fritillaries were joined by *Pyrameis atalanta*, which sailed under the lower boughs of the larch trees, or stood waving their wings against the bright green of the larch-needles. The species, however, was less frequent here than above Lavin, on August 10th, when it affected the birch-trees. The zig-zag soon led back again, and the *Vaccinium*-covered ground produced a few nice *Vacciniina optilete*, as one walked along. Again and again the path turned, and soon one saw ahead the characteristic steep rocks that had been blasted for the making of the road, but, before reaching the rocks, an open hollow full of blossoming-thistles was perfectly covered with swarms of butterflies, mostly the common Pierids, and the equally common large fritillaries, but comprising, also, *Pyrameis atalanta*, *Vanessa io*, and *Issoria lathonia*, the latter species, however, being much more abundant as one progressed, settling on the road and dashing off with characteristic vigour whenever approached. Just beyond here, one gets one of the most delightful pictures in the Alps. The steep dolomite rocks rise up almost perpendicularly from the roadway on one side, whilst on the other, a massive stone wall about 4 feet high protects one from the dangers of the steep skrees that fall away for probably 1000ft. to 2000ft. in some places, away to the river that looks like a silver thread winding its way from the gorge from which it emerges in the bed of the valley far, far below, whilst here and there the snowy caps of the mountains in the background make a perfect setting to one of those pictures that tourists travel the wide world over to see. Hardly had we reached the steep hot rocks before a black *Erebia* tumbled down in front of us, lifted itself gently over the stone wall on the other side, and, before we could look over, was gently dropping down the steep skrees as safe from the net as if 1000 miles away. How well I knew the habit. Thirteen years before I had seen *Erebia nerine* on the Mendelstrasse in hundreds, and had written up some of its interesting habits (*Proc. Sth. Lond. Ent. Soc.*, 1897, pp. 63 *et seq.*), and I knew I was on the track of this species again. Specimen after specimen came tumbling down, often to escape, more often to find itself in the net, or was observed sitting tightly in a cranny of the hot rocks. It was a little late, and so many examples had to be liberated that only a small bag could be made, but how delightful it was to lounge in the hot sun and watch the habits of this grand black velvety-looking fellow again, to see the ♂s drop over on to the skrees, to watch them battling for a flower, or to bag a ♀ as she sat lazily sucking the nectar from a flower growing in a cranny of the rock as high as the net would reach. But there were other insects besides *Erebia nerine* here. Strangest of all, *Melitaea dictynna*, that repeatedly settled on the road, coming, one wonders from where to such a resting-place. By the roadside, too, *Botys flaralis* was not uncommon, another unexpected species, whilst an occasional *Agriades*

bellargus seemed just as much out of place. An observation on a ♂ of this species was interesting from the point of view of suggesting that it was somehow out of its normal habitat here. This ♂, flying along the road, on being disturbed, made several attempts to fly over the low stone wall into the gorge below, but, on reaching a few inches above the level of the wall, was forced back, apparently by a difference in the pressure of the air on the two sides, although no wind appeared to be blowing, showing, however, that there was a distinct difference on the two sides of the wall, the one exposed to the hot road, the other to a fall of skrees extending hundreds of feet at an angle of something between 60° and 75°. At the same time *Erebia nerine* negotiated without effort this difference of air-pressure (?) that was fatal to *A. bellargus* and *Melitaea dictynna* when they tried to pass over; indeed, *E. nerine* appeared not to recognise the unseen barrier that baffled the other species. A little farther on the rocks fell back again, and the wooded slopes met the road once more. Here, by the edges of the larch wood, a well-marked form of *Erebia ligea* was not at all uncommon, and here, too, *Erebia tyndarus* and *Colias phicomone* commenced to appear. Among the thyme plants *Merrifieldia tridactyla* (*tetradactyla*) was frequent, and a few *Coenonympha satyrium* were noted, whilst many of the species already recorded re-appeared. Here, again, ♂ *Agriades bellargus* occurred, together with *Vacciniina optilete*, etc. A little farther on a heathy piece of ground was reached on which *Erebia tyndarus* was very abundant, but the sky becoming somewhat cloudy a halt was called. *Cleogene lutearia* appeared, and *Plusia interrogationis* was netted. Without having done anything special, our box was getting pretty full, and it was soon determined to turn back; nothing fresh was noticed except a rather large example of *Melitaea athalia*, flitting along the road in the same way as *M. dictynna* had previously been noted, whilst a number of very characteristic *Setina aurita* were taken as they fluttered from the rocks above to the skrees below. A quiet walk back to Zernetz brought us to our hotel, and the setting of our captures commenced. Next morning, August 12th, we booked a seat by diligence to Santa Maria in the Münster-Thal, and, on one of the most magnificent days of the tour, we picked up, as well as we could from the pace of the diligence, unconsidered trifles, over the whole distance between Zernetz and Santa Maria. On the ground traversed the preceding day we saw no new species, and on the long level beyond to the Ofenburg inn we saw nothing special, except that *E. nerine* was common the whole way. Indeed, on this occasion, the species was noted all the way up the Ofen Pass, being particularly abundant on the slopes at the very summit, and for a few hundred feet below the summit of the Pass on the Buffalero side. On the slopes just beyond the Ofenburg Inn, two worn ♀s, very different in size, of *Erebia gorge* var. *triopes* were taken; they were exceedingly well-spotted on the upperside, whilst *E. nerine* was again abundant on the same ground. On the slope by the footpath at the side of the inn, three species of *Colias*—*C. phicomone*, *C. edusa*, and *C. hyale*—were all observed at the same time. *Pieris brassicae*, too, was observed almost to the summit of the Pass, whilst a solitary *Pontia callidice* was seen at some little distance below the summit on the Buffalero side. A large ♂ *Lasiocampa quercus* was observed to rise and fly off in its usual headlong manner in the pinewood just beyond

the Ofenburg inn, but still more interesting was the fact that *Agriades bellargus* was seen flitting by the side of the road to within a few feet of the summit of the pass, resting on flowers, etc., but ♂'s only, not a single ♀ was observed in the valley, their habits and habitats appear to be essentially different here from those of the ♂'s. Soon after commencing the descent into the Münster-Thal, the weather changed, and clouds were the order of the day; how far down on this side *E. nerine* extended could not be observed, but probably for some distance, although confined apparently to the dolomite mountains. The Ofen Pass would evidently make a good collecting-ground, and the Ofenburg inn a good stopping-place, but evidently, in 1908, we were at least a week too late to catch *E. nerine* in its very best condition.

Observations on a sexual habit of *Leptidia sinapis*.

By A. M. COCHRANE.

Whilst walking near the Walensee, on July 30th, 1909, my attention was drawn to a ♀ *Leptidia sinapis* that was busy egg-laying; whilst thus engaged a ♂ happened to pass, and, observing her, hovered over her, flew down closely to her, and apparently forced her to settle on a clover leaf among the herbage. She took up a position so that she clung to the edge of a leaflet, her wings drawn up, her face and antennae in line with the edge of the leaf, so that the antennae were thrown one on each side of the costae of the two forewings, which were quite close together, the tips of the antennae turned backward; in this position the face of the ♀ was presented directly to the ♂, who took up a position on the top of the leaf directly in front of her; the ♀ stood quite still, whilst the ♂, standing before her, commenced to move his head rapidly from side to side in what appeared to be a most comical manner. At each movement he appeared to strike the costae of the forewings with his antennae, which were projected directly in front, but closer examination showed that the antennae fell somewhat short of the costae of the wings, and that the ♂ had got his tongue protruded at full length, and that it, therefore, extended some distance beyond the front of the antennae. Each time that the head of the ♂ was moved from left to right, the tongue of the insect was seen to be drawn quickly up the edge of the wing-costa, and as quickly moved back again for the operation to be again and again repeated, sometimes 20 or 30 movements were made before the ♂ took a rest, at other times as few as half-a-dozen; little by little the ♂ kept advancing his position, until, instead of being as at first almost half-an-inch distant from her, his face almost touched hers, and the movements of the ♂ then had the distinct appearance of the ♂ washing the ♀'s face, but, as soon as this stage of familiarity had been reached, the movements of the ♂ that had brought it so close to the ♀, caused the waving tongue or antennae to touch the antennae of the ♀, instead of the costae of her forewings. Immediately she gave a sudden start, flirted her wings suddenly downwards and back again, and stepped forward as if to drive back the ♂ to a further distance. This happened three or four times in quick succession, that is, in at least as many seconds, by which time the ♀ had stepped up on to the top of the leaf, standing, as it were, on her toes, the closed together wings thrown upwards at right angles to the surface of the leaf, her antennae thrown well back

on either side of the front of the forewings, and, in this position, she stood immobile in front of the ♂ as before; he stood in front of her, with his wings pushed well back, and began again the same peculiar operation, moving his head rapidly from left to right, his extended tongue flicking the costæ of the wings at each movement, and being drawn back rapidly as before. Slowly and gradually he got nearer and nearer to her, until flicking again her antennæ with his tongue, she flirted her wings quickly downward again and drove him backwards as before. The rapidity of the head movements of the ♂ was carefully counted and worked out at about twelve in five seconds. As the insects had now been under observation for over ten minutes, and the movements of the ♂ were quite continuous without a break lasting more than a second or two, I determined to eat my lunch and try to make out what such a peculiar habit could possibly mean; it could not possibly be a courting habit, because both specimens were somewhat worn, and the ♀ was busy egg-laying before the ♂ put in an appearance, and there was no attempt at pairing; it could not but be pleasing to the ♀, otherwise she could have gone off at any moment, nor could the ♂ be using any mesmeric effects upon her, for the moment he approached too closely, she drove him back with the swift flicking movements of her wings already described, bringing about as already noted a slight relative change in the position of the two insects; the performance, as above described, was continued for 47 minutes, when a bungling specimen of *Pieris rapae* swooped down upon them, hovered closely over them, and flew off, but not before it had disturbed the ♂, which rapidly left the ♀ and disappeared in another direction. The ♀, now unattended, flew slowly off, and was soon apparently again engaged in the ordinary duties of egg-laying. So far as finding out the meaning of this strange performance, the observation was a failure, but, as tending to show that the habit is a common one in the species, I may add that, about half-an-hour afterwards, another ♂ was observed to follow the same tactics towards a ♀ he came upon, but this time they were similarly disturbed by another *Pieris rapae* before the performance had been more than two or three minutes in progress; there will, therefore, no doubt, be no difficulty in the observation being repeated, when someone more fortunate than myself may be able to discover the meaning of this elaborate and strange habit which evidently occurs commonly between the two sexes.

Polyommatus sapphirus, Meig.=P. escheri, Hübner.

By J. W. TUTT, F.E.S.

In working through Meigen's *Sys. Besch. Eur. Schmett.*, vol. ii., I recently had to form a critical opinion as to his species *Polyommatus sapphirus*, pp. 22-23, pl. xlvi., figs. 4a-b. The following, for which I am indebted to Mr. Sich, is a translation of the description of Meigen's insect:—

Polyommatus sapphirus.—Above shining azure-blue, with white- and black-chequered fringes; beneath, ash-grey, with black eye-spots; the forewings at the base unspotted, the hindwings with orange-yellow marginal spots (♂) (*Esper's Schmett.*, i., pl. 55, fig. 2, *bellargus* var.). This butterfly is usually considered as an aberration of the ♂ of the previous one; I cannot decide whether this is correct or not. I find it in my collection, and there is doubtless a round dozen of them in the Baumhauer collection, but all ♂s; I have not yet seen a ♀. The upperside is perfectly

similar to *bellargus*, but the white fringes are spotted with black only on the hindwings, on the forewings, on the contrary, the bases of the fringes are all along blackened (Esper's above-mentioned figure differs in this, and shows also on the forewings black spotted fringes, on the hindwings, however, black marginal dots). The underside is ash-grey, and agrees with that of the previous butterfly (*bellargus*), except that the eye-spots at the base of the forewings in front of the central streak are entirely absent, and the orange-yellow marginal spots are also absent; the hindwings exhibit no difference (Meigen).

Meigen's reference to Esper led me at first, somewhat thoughtlessly, to suppose that it was a form of *Agriades bellargus*, the figure suggesting an approach to ab. *pallida*, but the fringes on the upper-side, and particularly the spotting of the underside showed it to be a *Polyommatus*, and not an *Agriades*. I at once compared the insect with my very long series of *Polyommatus escheri*, to which I, on mature consideration, have referred it, and found it identical with certain specimens in my collection, in which the marginal border of the forewings is reduced to a minimum, the nervures marked in black on the extreme outer margin, the fringe of the forewings white, of the hindwings white chequered with black at the termination of the nervures, the black dashes, however, only extending half-way through the fringes, the outer half being entirely white. The underside, however, is absolute; there can be no doubt whatever that it represents the underside of *Polyommatus escheri*: it is quite unlike the underside of any *Agriades bellargus*. The reason for Meigen's reference to *bellargus*, Esp., *Die Schmett.*, pl. lv., fig. 2, is obvious, as the underside figured by Esper is of the aberration that exhibits no basal spots on forewings, a specific character in *P. escheri*: the upperside, however, is *bellargus* of the form *puncta*.

I had never, however, come across the name (*sapphirus*) in print (except in Meigen), and had no idea it had been used, but, strangely, I noticed, yesterday evening (July 3rd) that, in the current issue of the *Int. Ent. Zeits. Guben*, iii., p. 78, Strand notes, under *bellargus*, Rott., the capture of "an example of ab. *sapphirus*, Meig., in the Taurus in June, 1907." Turning over some notes on *A. bellargus* to-day, sent me by my kind friend Mr. Gillmer, I observe a further statement by Stollwerck, who states that he has taken *bellargus* ab. *sapphirus*, Meig., in the Rhine Provinces. The matter, therefore, wants correcting at once, as it is inadvisable to allow *sapphirus*, Meig., = *escheri*, Hübn., erroneously to get currency as an aberration of *bellargus*. We wonder what form of *bellargus* taken in the Taurus, Strand refers to *sapphirus*, Meig., and what form taken in the Rhine Provinces, Stollwerck refers to it. Are these merely the form of *bellargus* without basal spots to the forewings beneath?

As tending to illustrate the superficial resemblance *Polyommatus escheri* bears to *Agriades bellargus*, we may note that we observed yesterday (July 3rd) a very fine characteristic ♂ of *P. escheri* in the midst of the lovely series of *A. bellargus* in the British Museum coll., of course very conspicuous once attention is fixed on it, but easily overlooked until the necessary attention is given. Similarly, ♀s of *Agriades meleager* pass muster in the same collection, as ♀s of *A. coridon*, in spite of the highly crenulated margin of the hindwings of the former. Very extraordinary, of course, yet one is always finding just as extraordinary "howlers" in one's own collection.

This does not, of course, alter any names, *escheri*, Hb. (1819), is

of course, long prior to *sapphirus*, Meig. (1830), but one wishes, at once, to prevent the latter being attached to the wrong species.

The habits of *Araschnia levana* and its summer form *prorsa*.

By T. REUSS.

Do *Araschnia levana* and its seasonal form, *prorsa*, differ widely not only in facies, but also in habits and favourite haunts? If so, has "mimicry" of other species anything to do with this?

Many who have seen the beautiful *Araschnia levana* var. *prorsa* in its natural haunts on the continent will have been struck by the resemblance this butterfly bears to *Limenitis sibylla*, not only in facies, but also in a certain peculiarity in the habit of flight when the insect is at play. Resting on the leaf of a bush in a wood-clearing, *Limenitis sibylla* launches itself vertically up into the air, towers to the height of several yards, and then, after soaring an instant, dives and drops gracefully back to its first resting-place. Several of these fine, white-banded butterflies shooting up alternately straight as rockets into the light, and again falling back on to the sun-warmed leaves of the bushes from which they rose, make a dainty spectacle, and suggest the elfin dances of the fairy tales to the mind of an observer. I had not heard, nor had I myself noticed, that any other species ever indulged in this kind of dance (*L. sibylla*, while visiting puddles on a road, flies like any other Nymphalid), when, on a bright morning late in August, a few years ago, I first came across several black, white-banded butterflies (*prorsa*) flying over the bushes on the margin of a wood in Mecklenburg. I had not expected to see the insect, and was not thinking of the species, when these specimens appeared (large ♀'s) and quite surprised me into mistaking them for *L. sibylla*, in spite of the lateness of the season. They danced—exactly as I had seen *L. sibylla* dance—up and up, straight into the blue, and then came the broad soaring movement, the dive down, and the fall. I felt mystified. This was, and yet was not, *L. sibylla*. I hastily netted a butterfly, and after a little "rubbing of eyes" I recognised it to be *Araschnia levana* var. *prorsa*, which form I had not seen alive before.

When I remembered the brown, fritillary-like *A. levana*, which I had caught [also by chance—unexpectedly—while hunting for *Melitaea aurinia* (*artemis*)] in the spring of the same year near Potsdam, I felt forcibly how significant the fact that these two widely different butterflies should be forms of one and the same species, might prove to be. Last winter Mr. Merrifield broached the subject, remarking that it would be interesting to know also whether the spring form *levana* flies like the fritillaries it so much resembles.

This instantly reminded me that *levana* had unexpectedly fallen a prey to my net while I was on the look-out for *M. artemis* on the boggy meadows round the Havel lakes. This was on a cloudless morning in May. *Celastrina argiolus* and *Nisoniades tages* made themselves conspicuous on the road to the Havel, and I succeeded in netting a pair of fine *Papilio machaon*. The grass of the meadows was short as yet, but many flowers were blossoming in patches, and these were well visited by butterflies and other insects. *Melitaea artemis* came rushing along in rapid flight low over the grass, and I netted several fine specimens, each one costing me a chase and many a splash

through the deceptive mossy covering into the brown "Sumpf" of the moor. I then set myself to watch one of the clumps of flowers, and, after a few seconds, netted what I thought must be some kind of fritillary—I had noticed *Brethis dia* on the flowers before—but on examination I found a strange butterfly in my net—at least, it had been strange to me till then—none other than *Araschnia levana*, with its beautiful yellow-veined and lilac-splashed underside. Having thus "had my eyes opened," I was soon able to distinguish other specimens of *A. levana* dashing about over the meadow. They had a more sturdy appearance than the fritillaries, and flew more rapidly (more like *Vanessa urticae*, *Pyrameis cardui*, when travelling), but here on the boggy meadows it was certainly easy to mistake them for fritillaries. Presently I felt that I should like a fine *M. artemis* that was just then flying rapidly past me, in the usual way. I chased and captured it after a hard run, and then, with the brown mud of the marsh gurgling up higher and higher round my legs, for it was impossible to stand without sinking where the chase had led me, I discovered my quarry to be *A. levana* again. I have not been able to continue my observations of *levana* and *prorsa* in the natural state, and I do not know whether *A. levana* always haunts meadows or moors together with the fritillaries†, for which it may be mistaken by its size and appearance in flight, while the summer form *prorsa* chooses the wooded parts to disport itself, where *Limenitis sibylla* resembles it in facies, and even in a striking peculiarity of flight, and whether, if so, "mimicry" of other species comes in as an explanation, or whether the difference in facies, together with the different conditions in the vegetation of spring and summer, suffices to account for the change of haunts, just as natural disposition and difference in temperature certainly play a chief part in bringing about the change of facies.* Mimicry in the case of *A. prorsa* and *L. sibylla* has been upheld by some, e.g., Weismann, and denied by others. e.g., Standfuss, O. Prochnow.

Some notes on *Fredericina calodactyla* (zetterstedtii) (with plate).

By EDWARD GOODWIN, F.E.S.

Whilst spending a week-end with my friend, Mr. T. Blest of Woodnesborough, I took advantage of the opportunity to try for the larva of *Fredericina calodactyla*. On May 10th, therefore, we cycled to the wood where the species occurs, arriving there about 2.30 p.m., and at once started searching along the rides. The foodplant was not very plentiful, and we carefully examined every one we found, but only met with a few of my old acquaintance, *Leiopilus tephradactylus*.

We then tried where the undergrowth was one or two years old, but here we found that other weeds had smothered the golden-rod, and we returned to the rides. After about two hours' fruitless search we reluctantly decided to give up what appeared to be a hopeless quest, and started back to our cycles.

On the way we had to recross a part of the wood which had recently been cut down and cleared. As is usual in such cases there were many small plants of *Solidago virgaurea*, but when going over it the

† No, I have taken it on a dry road in the Murgthal and also sitting on the leaves of bushes, when it looks, at a distance, much like a large *Nemeobius lucina*.—G. W.

* In the latter case mere "parallelism" would account for resemblance to other species.—T. R.

first time we gave it very little attention, as I thought it most unlikely that the ova would be laid in the dense wood, which was the condition of this part in 1904. However, having failed everywhere else, we decided to give it a trial, and were soon rewarded for our patience.

Noticing that one of the leaves of a small plant was slightly withered, I pulled the others away from the centre, and found a little frass, and further down, feeding right into the root-stalk, was the object of our search. The next two hours were mostly spent on our knees carefully examining all the little plants in the immediate proximity, and, when we finally had to relinquish the search, we had found two dozen.

In two or three cases the infested plants exhibited distinct signs—a general appearance of unhealthiness, and a little web and frass showing in the middle—in others the only indication was a slightly withered leaf, but the majority that we found showed not the slightest outward sign whatever, and were only discovered by pulling away the leaves (more or less unexpanded) from the centre.

Having only small boxes, I was obliged in most cases to cut off the part containing larvæ to bring home. These were laid on fresh plants, into which the larvæ soon transferred themselves, each forming a web between the base of a leaf and the root-stalk into which it fed.

For purposes of observation I managed to bring home four infested plants intact, and speedily planted them in a pot. One of these plants was very small, and in the centre was a collection of web and frass which showed signs of increase almost daily, but the leaves did not wither. The others were larger plants, and there were no outward signs of the contained larvæ, but, on pulling away the leaves, the increase in quantity of frass was noticeable.

One of the larvæ came out and roamed about for two days. When crawling on a smooth surface it spun a web zigzag fashion in order to get a foothold, in the same manner as the larvæ of many other species.

Pupation took place during the last fortnight of May in the tunnels formed by feeding. On May 24th, at 8.30 a.m., I was examining the small plant previously referred to when I was surprised to see the head of the pupa being pushed up through the web and frass. It continued to wriggle about until about 3 p.m., by which time it had assumed the position shown in illustration (pl. xiv.), in which it remained until emergence. I eventually found that all the other pupæ had behaved in a similar manner, but, the plants being larger and the leaves more or less erect, they could not be seen without first pulling the leaves away from the centre.

The first imago appeared on June 9th, and the last on July 4th. A total of eighteen was reared. Emergence nearly always took place between 1 p.m. and 4 p.m.

[We have to congratulate Mr. Goodwin on his success. Until May 1904, the larva and pupa of *Fredericina valodactyla* (*zetterstedtii*) were unknown, but we were then fortunate in getting a single larva at Folkestone, the meagre observations concerning the habits of which, together with excellent detailed descriptions of the larva and resulting pupa, made by Dr. Chapman, were published in *A Nat. History of the British Lepidoptera*, vol. v., pp. 167-172.—ED.]

A few notes on some of the British Alucitides observed in 1909
in the Wateringbury district.

By EDWARD GOODWIN, F.E.S.

GILLMERA OCHRODACTYLA.—This species seems to be very local. I could only find it at one place, on the Medway, where I took a fair number of larvae. The first imago emerged July 14th, the last August 7th, practically none being stung.

CAPPERIA HETERODACTYLA (TEUCRII).—One imago captured at Boxley on August 3rd.

OXYPIILUS PARVIDACTYLUS.—Captured June 17th at Boxley.

MARASMARCHA LUNÆDACTYLA (PHÆODACTYLA).—The larvae were exceedingly common on a small patch of restarrow, near Ryarsh. The first imago was reared on July 7th, and they were all out in a week.

ADKINIA BIPUNCTIDACTYLA.—First captured on August 24th. This species is uncommon here.

OIDÆMATOPHORUS LITHODACTYLUS.—I took small larvae of this species freely in April and May, at many places on the chalk-hills. First to emerge July 8th, and they continued to come out throughout July and August.

EMMELINA MONODACTYLA.—First noticed (a pair) on August 17th.

OVENDENIA SEPTODACTYLA (LIENIGIANUS).—Larvae were very common locally. Emergence took place between June 25th and July 17th.

HELLINSIA CARPHODACTYLA.—I was pleased to find some larvae of this species on the chalk-hills during May and late April. The insects (first brood) emerged between June 17th and July 19th. Very nearly all were reared, in fact apparently none was stung. Generally emerge in the night, occasionally in morning.

MERRIFIELDIA TRIDACTYLA (TETRADACTYLA) AND M. BALIODACTYLA.—These were captured at Ryarsh on August 16th, the only occasion on which I tried for them.

PORRITTIA GALACTODACTYLA.—Imagines emerged between June 10th and July 5th. The larvae were very common everywhere throughout the district.

STENOPTILIA PTERODACTYLA and *ALUCITA PENTADACTYLA*.—I bred a number of *S. pterodactyla* and *A. pentadactyla*. The larvae of the latter were exceedingly common on a pink convolvulus close to my back door.

LEIOPTILUS TEPHRADACTYLUS.—Larvae of *Leioptilus tephradactylus* commenced feeding at the beginning of April after hibernation. At this time the larvae were, on the average, about one-third grown, but they varied in size considerably. In colour they were creamy-white or yellowish-white. At first they would eat one or two irregular round holes in a leaf, afterwards they ate from the edge of a leaf either fully expanded or unexpanded. Their resting-place in the daytime was on the midrib, generally head downwards on the underside of the petiole near the base, where they were very inconspicuous. Later on, they are easily found, their presence being betrayed by the amount of feeding. They appeared to come up to feed in the early evening—about an hour before sunset. When feeding they lie on the top of the leaf. They fall from their resting- or feeding-place at the slightest disturbance, rolling in a loose ring and often disappearing in the surrounding herbage and rubbish. Occasionally, but not often, they

eat only the upper cuticle in the same way as they do in the autumn, but in larger patches. I have even seen full-grown larvæ do this. Some will crawl on to a dead stalk or leaf to change their skins, otherwise each appears to remain throughout, on its own original plant. After the last change of skin they are pale green. By the end of April a few were nearly full-grown, but the majority were still less than half-grown. I noticed the first to spin up for pupation on May 10th. On May 18th several had pupated, always head downwards. They usually crawl off the foodplant to pupate. By the end of May nearly all had pupated. The first one emerged on June 2nd, but I had given away nearly all the early pupæ. I bred some daily until July 6th, when the last one emerged.

On breeding *Phytodecta pallida*, L., from the larva.

By HORACE ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

On June 21st I explored the downs near Chilworth, Mr. Champion having told me I could find *Phytodecta pallida*, L., there. The beetle was scarce, only five specimens being taken after beating much hazel. I, however, beat a number of phytophagous larvæ from the hazel, which I concluded was that of the beetle. I took home some eighteen larvæ, and fixed them up on hazel branches in a bottle of water buried in sand in a flower-pot with muslin over all. The larvæ fed up quickly, and all pupated by the end of June. They entered the sand to pupate, where they make a small cell. Thirteen perfect specimens and one cripple hatched in the second week in July; two larvæ died, and the remaining two produced dipterous parasites. Mr. Austin tells me the flies are *Meigenia floralis*, Fall., which has been recorded as parasitic on *Crioceris 14-punctata*. The larva and pupa have been described by von Frauenfeld (*Verhandl. zool.-bot. Ges. Wien.*, xvi., 2, 1872, pp. 389-399), but he does not state whether the larva pupates on the leaves or in the ground. We are now able to state that the latter is the case. The larva and pupa are emerald-green in colour. When ready to pupate, the two larvæ that produced the dipterous flies turned brown, and the pupa of the dipteron was found inside the larval skin.

The larva of *Phibalapteryx lapidata*.

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

A larva of *P. lapidata*, somewhat shrunk and shrivelled, and somewhat darker in tint than some seen recently at a meeting of the South London Entomological Society, has been handed me for observation. The larva, fairly cylindrical, is 12mm. long (a sound larva probably 15mm.) and nearly 2mm. across, only slightly narrower forwards, head 1.3mm. across front, transverse to body. Colour, in longitudinal stripes dorsally, pale ochreous and pale fuscous, warm reddish-ochreous, and the dark lines brown rather than fuscous. The black points of the hair-bases are also conspicuous. The dark lines are—a narrow dorsal one, a subdorsal one including tubercles i and ii (ii being very little further out than i), after a rather wider pale line, then a rather wider dark one, with a narrow pale line dividing it into two; tubercle iii is in the lower dark portion of this, then a pale band with black spiracles, very like, but rather larger than, hair-bases. This

pale band begins the warmer, redder, but paler, ventral area. It is followed by two darker (reddish) fine lines, then after a broader pale band, a dark band, and a very fine, not quite so dark, medio-ventral line.

The subsegmentation is elaborate and complicated, dorsally are seven subsegments (2nd to 4th abdominal segments), five small, and two larger, the latter again subdivided each into two, if these be reckoned separately, then nine nearly equal, subsegments. The large ones are the first and last. The first large one carries tubercles i and iii; the second and third, united laterally into one, bear the spiracle; the fourth has a tubercle (iv ?) behind and below spiracle; the fifth carries ii. Below, and in front of, the spiracle, is a tubercle on the first subsegment, which here broadens obliquely backwards to quite below spiracle; lower, on two bosses, the anterior of which combines subsegments one, two, three, and four, and the posterior five, six, and seven, are two hairs; below the front of these is a hair on the darker band most ventral (except the medio-ventral line), and below the other are two hairs, one on each of the pale bands below, and one therefore dorsal, the other ventral, to the hair in front of them just mentioned. The hairs are of fairly uniform length, about 0.25mm. to 0.3mm. long, dark brown, stiff and smooth, on the conspicuous black bases already referred to. There are other very minute hairs or hair-points, one, for example, in front of i, and one below iii. Behind, just above, prolegs, is a slight dark projection, but no points. The head is rounded, smooth (at least its granulations are very fine), ochreous, with brownish marblings, four eyespots in a semicircle, a hair looks like a fifth, and a central one; a good many hairs, rather paler than those on the body.

The prothorax has two transverse rows of four hairs (two on each side) apparently on a prothoracic plate, and one at each end, with a smaller companion below it (between the two rows), just beyond plate, and not far *above* spiracles. The subsegmentation makes it difficult to define margins of the meso- and metathorax, but, on a forward subsegment of each, are, in a transverse row, six hairs (three on each side) down to spiracular level, the two most dorsal in the two most dorsal pale bands. Laterally, the prothorax has a small hair and accessory in front of, and *below*, spiracle; lower are two hairs on a level, just above legs. On the mesothorax and metathorax, below the three hairs already noticed, is a rather smaller one in a hollow; then two on a level, rather far apart, on a large lateral boss (lateral flange ?) with another below the front one, on a process of the same raised boss, then, after some elevations unarmed, is a hair on a boss above leg. On the lateral view, the dorsal hairs do not look so much in front as they did on dorsal view, but the complicated wrinklings, to describe which would be practically impossible, that denote subsegments, flanges, etc., make clear demarcation of a segment difficult in the living larva.

Mr. Buckler's figure of the larva seems rather large, and is much paler than the specimen before me, those shown by Mr. Newman at the meeting of the South London Entomological Society (June 24th, 1909) were also (one or two yellow at least) paler—possibly this one is darkening for pupation.

Lepidoptera of the Grisons—The Muranza-Thal.

By J. W. TUTT, F.E.S.

The notion that Santa Maria, in the Münster-Thal, would prove a good collecting centre, did not work out altogether satisfactorily in practice. The weather was certainly not unsatisfactory, but success was not achieved. The morning of August 13th, 1908, fairly bright, but with a good many cloudy periods, was spent in exploring the lower half of the well-known Muranza-Thal leading up to the Wörmser Joch, the valley and the pass that lead from the Münster-Thal to the summit of the Stelvio. In the wooded part of the path above Santa Maria, one was simply astounded at the comparative dearth of butterflies—species and specimens. Here and there a sloping bank provided sport, but to the keen collector this was not altogether satisfying, and *Agriades coridon*, *Aricia astrarche*, *Erebia goante*, and *E. tyndarus* may be noted at once as the only common species; *Pararge maera* was fairly large and typical, *Brenthis amathusia*, here and there common, but going over, one ♂ with a pale yellow spot below the disc of each forewing; *Issoria lathonia*, now and again, freshly emerged, a single ♀ *Erebia ceto*, and on one slope a nice lot of *Heodes viryanreae*, the ♀'s of the *zermattensis* form, but not so suffused as those of the Suldenthal, whilst, at the same place, *Coenonympha pamphilus* was quite unexpectedly met with, and, as elsewhere in 1908, *Pieris rapae* was not uncommon. In the lower part of the valley a fine form of *Hipparchia semperi* occurred sparingly, and *Pyrameis cardui* and *Vanessa io* repeatedly intruded themselves on one, but of the larger species *Argynnis niobe* was the most abundant, and *Eubolia mensuraria* was frequently disturbed. Only two Anthrocerid species were noticed, *Anthrocera transalpina*, freshly emerged, and *A. purpuralis*, going over, and somewhat worn. Above the tree-limit one expected to meet a number of special insects, but one was quite disappointed, for, in spite of a bright sun, for fully an hour, a keen wind swept from the Stelvio through the valley, and hardly anything could rise; on one flowery slope *Brenthis pales* and *Colias phicomone* were abundant, whilst in a sheltered corner at the foot of the same slope, a sweep of the net among some quarrelsome or playful blues brought in the strange combination of three ♂ *Albulina pheretes*, three ♂ *Agriades coridon*, and one ♂ *A. bellargus*, *A. coridon* being abundant hereabouts, but no more *A. pheretes* or *A. bellargus* were seen. Here, too, a very worn specimen of *Brenthis euphrosyne* was captured, and *Nomiades semiargus*. A few newly-emerged *Hesperia alveus* were netted, but a long grind up the valley only resulted in finding a single ♀ *Latiorina orbitulus*, a worn ♀ *Erebia gorge* var. *triopes*, a few *Crambus conchellus*, *C. culmellus*, *Cidaria populata*, *Merrifieldia tridactyla* (*tetradactyla*), and *Setina aurita*, whilst swarms of larvae of *Aglais urticae* occurred on every bed of nettles. By the time that the inn in the upper part of the valley was reached, the clouds were gathering on the mountains on either side of the valley, and when the sun disappeared the keen wind soon took on, at this elevation, an icy chilliness. A drizzling rain began to fall, and the short cuts back to Santa Maria were traversed in a hurried manner; once back in the woods, however, the wind was not so biting, but, before Santa Maria was reached, the rain was falling heavily and persistently throughout the valley. Our second essay on the Wörmser Joch was

still more unfortunate, for, starting on the morning of the 15th before 7 a.m. in brilliant sun, the valley was enveloped in clouds and rain before the limit of the woods was reached, and the upper part of the valley to the summit of the Stelvio was tramped under the most depressing conditions. Suffice it to say that, on that day, at the very summit of the Stelvio, the sun broke through sufficiently for a few minutes to tempt us on the glaciers, and that we found on the surface of the ice within 20 yards, three specimens (two ♂s and one ♀) of *Pieris brassicae*, one *Pyrameis atalanta*, and a whole army of Diptera and Coleoptera quite dead and numbed, no doubt caught when flying by a cloud that obscured the sun, forcing them to the earth, and falling on the snow instead, met with this tragic fate.

Aberrations of British Butterflies.

By T. REUSS.

On May 28th last, in a grassy hollow near Ware, I captured a blue ♀ aberration of *Polyommatus icarus*, L., which I describe as follows:—

Upperside: Colour light blue, whitish along the costa. The black marginal lunules of the forewings are marked off against the black margin, with bluish-white instead of with orange, and this leaves a margin scarcely broader than in ♀ *Cyaniris semiargus*. The hindwings remind one somewhat of ♀ *Celastrina argiolus* in the marginal markings, only one of the black (anal) lunules being marked with orange, though a magnifying glass reveals some orange scales also in the other lunules. *Underside*: Lighter than usual in ♀ *Polyommatus icarus*, and approaching in ground colour the male butterfly. The orange and black markings are very bright.

In the same place on June 13th, a brilliant sky-blue Lycaenid flew up at my feet, and I lost no time in netting the insect, which looked like *Agriades bellargus* in flight. However, *A. bellargus* does not occur in the place, and my capture, I think, is an aberration of ♂ *P. icarus*, recognisable by the pure white outer marginal fringe, as in normal *P. icarus*, but otherwise approaching in the upperside facies *A. bellargus*. It exhibits the brilliant blue so characteristic of *bellargus*, and also the fine pure black margin with a complete chain of well-defined, jet-black spots on the hindwings as in *A. bellargus* ab. *puncta*: the whitish nervures become black on the margin. The underside is that of normal ♂ *P. icarus*.

The specimen must not be confounded with the northern variety figured in South's *Butterflies of the British Isles*, which has a few dark spots on the margin of the hindwings; it is totally different.

Vanessa urticae ab. *luna*, n. ab.—On July 26th, I bred an aberration of *V. urticae* from wild Hertfordshire larvae, which showed the following characteristics:—

Upperside forewings: The black marginal band is without blue lunules at the apex. There are only three small blue lunules in the median part, and there is a large yellowish spot in the inner angle. The yellow spot between the second and third costal blotches is narrow and crossed with black. *Upperside hindwings*: Again, as in the forewings, the four (in the right hindwing three) blue lunules of the costal and median part are either very indistinct or entirely replaced by the black of the marginal band. The first two lunules of the four in the anal wingpart coalesce and form a large conspicuous blue crescent, the small lunules in the anal tips are normally developed. The dark orange belt of colour is clouded with black

in the costal part. *Underside*: The hindwings are darker than normal, the large crescent is conspicuously marked.

The parts of the facies not mentioned are normal.

I suggest for this progressive form of *V. urticae* the name of ab. *luna*, from the large blue crescent enhanced by an otherwise almost wholly black marginal band. It is, perhaps, of interest to note the development of the blue lunules in this specimen in comparison with other aberrations in which, reversely, the costal (apical) markings are favoured at the cost of the anal lunules (=ocelliformity, see *antea* pt. 4, pl. vii.).

On August 8th, I bred an aberration of *Vanessa io* from wild Hertfordshire larvæ, in which the ocellus of the hindwings is disintegrated into three distinct blue lunules. On the right hindwing a fourth blue spot is marked (this spot appears also in otherwise normal specimens), and the place for a fifth is indicated. Thus a chain of blue spots is suggested as in *V. urticae*. On the forewings the ocellus is suffused in its whole breadth by bright metallic blue-violet, the yellow parts are very narrow, and more grey in colour. The underside of the hindwings is suffused with yellow scales in the region of the discal cell in the manner often seen in many aberrations of *V. urticae*. The larva had pupated on July 19th.

List of Lepidoptera captured recently in Rossshire.

By DOROTHY J. JACKSON.

(Concluded from p. 181).

Lobophora halterata, Swordale, fairly common, imago reared May 20th, 1908. *L. riretata*, one specimen taken at Loch Awe in the beginning of June, 1908, by Evelyn V. Baxter. *L. carpiuata*, Swordale, common, larva, July 9th, 1908. *Thera juniperata*, Swordale, common, imago taken at light, October 20th, 1908. *T. rariata*, Swordale, common, imago, June 28th, 1908. *T. firmata*, Swordale, common, July 17th, 1908. *Hypsipetes ruberata*, Swordale, fairly common, larva feeding on sallow, September 19th, 1906; Stirkoke, Wick, larva September 11th, 1908. *H. trifasciata*, Swordale, abundant, imago, May 29th, 1908; Dornoch, larva, September 27th, 1906; Wick, Stirkoke, larva, September 7th, 1908. *H. sordidata*, Swordale, abundant, larvae feeding on whortleberry, May 7th, 1908, imago emerged, July 23rd, 1908; Balmacara, larva, June 15th, 1907; Cawsterburn, Wick, imago, September 7th, 1908. *Melanthia bicolorata*, Swordale, common, imago, August 30th, 1908. *M. ocellata*, Swordale, common, imago, June 25th, 1908. *Melanippe hastata*, four moths flying amongst bog-myrtle, growing on a small island in Loch Maree, June 2nd, 1908. *M. sociata*, Swordale, common, imago, June 15th, 1908. *M. montanata*, Swordale, abundant, larva, May 5th, 1908, imago, June 14th, 1908. *M. fluctuata*, Swordale, fairly common, especially frequenting low ground near the sea, imago, August 7th, 1908. *Anticlea badiata*, Swordale, common, imago taken at light, April 30th, 1908. *A. nigrofasciaria*, Swordale, common, imago taken at light, May 11th, 1906. *Coremia munitata*, Swordale, common, imago, July 17th, 1908. *C. designata*, Swordale, imago, July 24th, 1907. *C. ferrugata*, Swordale, fairly common, imago, June 14th, 1908; Kyle of Loch Alsh, imago, June 14th, 1907. *Camptogramma*

bilineata, Swordale, common, imago, July 19th, 1908. *Cidaria siterata*, Swordale, common. *C. miata*, Swordale, common, Tarbat Ness lighthouse, autumn, 1908; Stirkoke, Wick, larva beaten from willow, September 25th, 1907. *C. corylata*, Swordale, common; Loch Maree, imago, June 2nd, 1908; Dornoch, larva, September 26th, 1906; Stirkoke, Wick, larva, September 27th, 1907. *C. truncata*, Swordale, common, imago, July 7th, 1908. *C. immanata*, Swordale, common, imago, August 16th, 1908. *C. suffumata*, Swordale, common, imago, May 20th, 1908. *C. silacea*, Swordale, fairly common, imago, June 11th, 1908. *C. prunata*, Swordale, larvæ feeding on gooseberry, June 24th, 1907. *C. testata*, Swordale, common, larva, June 25th, 1908. *C. popula*, Swordale, common, larvæ swept from blaeberry, May 7th, 1908, from sallow, Loch Usie, Strathpeffer, June 20th, 1908, imago, July 19th, 1908; Stirkoke, Wick, September 6th, 1908. *C. fulvata*, Swordale, common, imago, September 10th, 1907; Balmacara, West Ross, larvæ feeding on garden rose, June 14th, 1907. *Eubolia limitata*, Swordale, common on low ground, especially near the sea, Nigg, August 26th, 1908. *E. plumbaria*, Swordale, very local, frequenting a certain hillside, where *Genista alypica* grows amongst the heather, imago, June 26th, 1908. *Carsia paludata*, Swordale, not very common, frequenting the boggy parts of the moor, imago, August 6th, 1908. *Anaitis playiata*, Swordale, not very common, imago, August 16th, 1907. *Chesias spartata*, Swordale, common, imago taken at the lighthouse, Tarbat Ness, autumn, 1908. *C. rufata*, Swordale, imago taken at light, May 11th, 1906.

PYRALIDES.—*Scopula alpinalis*, two moths flying on a dull day on the higher slopes of Ben Wyvis, on July 16th, 1908; several more in the same locality, July 22nd, 1908, disturbed from the dripping grass to fly briskly away with usually rather a high flight, and often disappearing in a tantalizing manner over the edge of a cliff; one specimen taken as low down as about 1500 feet. *Scopula lutealis*, Swordale, common, September 8th, 1907 (imago); Stirkoke, Wick, imago, September 6th, 1908. *Pyrausta ostrinalis*, Swordale, fairly common, imago, June 21st, 1908. *Herbula cespitalis*, Swordale, fairly common, imago, May 31st, June 25th, and August 9th, 1908. *Botys fuscalis*, Strathpeffer, imago, June 20th, 1908; Falls of Conon, imago, May 30th, 1908. *Pionea forficalis*, Swordale, taken at light, August, 1907. *Botys terrealis* feeding on *Solidago virgaurea*, on the sea cliffs at Fortrose, September 24th, 1908. *Hydrocampus nymphæata*, Kinraig, Invergordon, flying over a marsh July 27th, 1907.

ALUCITIDES.—*Gillmeria pallidactyla*, Swordale, imago, August 6th, 1907. *Platyptilia gonodactyla*, Swordale, resting on ragwort, August 30th, 1908. *Amblyptilia cosmodactyla* (*acanthodactyla*), imago resting on heather, Kinraig, Invergordon, September 4th, 1907; Swordale, resting on Michaelmas-daisy, November 3rd, 1908; imago swept from scabious, September 27th, 1908. *A. punctidactyla*, Swordale, common, larvæ feeding in seed-vessels of primrose, cowslip, and polyanthus, July 13th, 1908. [For foodplants hitherto recorded for this species, see *Nat. Hist. Brit. Lep.*, v., p. 307.—ED.]

ORNEODIDES.—*Orneodes hexadactyla*, Swordale, larvæ feeding in buds of wild honeysuckle (woodbine) July 24th, 1908, imago reared October 2nd, 1908.

CRAMBIDES.—*Crambus pratellus*, Swordale, abundant, imago, May

29th, 1908; Loch Maree, June 2nd, 1908. *C. dumetellus*, one imago taken at Lairn flying amongst grass, whin, etc., near the sea, July 29th, 1908. *C. furcatellus*, several moths flying over the high grassy slopes of Ben Wyvis on a dull day, July 16th, 1908. *C. margaritellus*, one imago flying over coarse grass in a boggy part of the moor in bright sunshine, August 6th, 1908. *C. pinellus*, one imago beaten from sallow, Kincaig, Invergordon, September 4th, 1907. *C. perlellus*, Swordale, common, near the sea, imago, July 20th, 1908. *C. tristellus*, Swordale, very common, imago, July 18th, 1908. *C. culmellus*, Swordale, common, imago, June 28th, 1908. *C. hortuellus*, Swordale, common, imago, June 21st, 1908. *Phycis fusca*, Swordale, imago flying wildly in a boggy part of the moor, June 30th, 1908. *Aphomia sociella*, Swordale, fairly common, imago, July 5th, 1908.

TORTRICIDES.—*Tortrix rosana*, Swordale, imago beaten from sallow, August 23rd, 1908. *T. ribeana*, Swordale, common, imago reared, July 11th, 1908. *T. corylana*, Swordale, imago reared July, 1907. *T. viburniana*, Swordale, common, imago, July 16th, 1908. *T. viridana*, Swordale, common, imago (reared) July 7th, 1908. *T. ministrana*, Falls of Conon, Strathpeffer, three specimens beaten from birch, May 30th, 1908. *Leptogramma niveana*, Loch Achelty, Strathpeffer, one imago beaten from birch, October 9th, 1908. *Peronea sponsana*, Swordale, imago, October 10th, 1908; Stirkoke, Wick, September 3rd, 1908. *P. rufana*, Cannich, Strath Glass, Invernessshire, imago swept up from bogmyrtle (*Myrica gale*), October 31st, 1908. *P. mixtana*, Swordale, common, imago, October 4th, 1908. *P. schalleriana*, Swordale, fairly common, imago, August 24th, 1908. *P. variegana*, Swordale, imago, abundant, August 19th, 1908; Stirkoke, Wick, imago, September 13th, 1908. *P. hastiana*, Swordale, common, imago, October 12th, 1908. *P. ferrugana*, Swordale, very common, imago, October 2nd, 1908; Falls of Conon, October 3rd, 1908. *P. caledoniana*, Swordale, common, imago, August 19th, 1908; Camsterburn, Wick, imago, September 13th, 1908. *P. aspersana*, Swordale, common, imago, July 24th, 1908; Nigg, imago, August 26th, 1908. *Rhacodina candana*, Swordale, common, imago, August 30th, 1908; Stirkoke, Wick, September 13th, 1908. *Teras contaminana*, Swordale, fairly common, imago, August 25th, 1908; Stirkoke, Wick, imago, September 13th, 1908. *Penthina sauciana*, Swordale, taken amongst heather and whortleberry, at the foot of Wyvis, June 22nd, 1908. *P. marginana*, taken flying over a boggy heath near Edderton, July 2nd, 1908. *Pardia tripunctana*, Swordale, imago beaten from wild rose, July 1st, 1908. *Sericoris littoralis*, imago flying at the foot of the cliff amongst campion, etc., Duncansby Head, September 26th, 1907. *S. rivulana*, Kincaig, Invergordon, flying amongst heath, July 24th, 1908. *S. lacunana*, Swordale, imago, June 27th, 1908. *S. irriguana*, several moths flying over whortleberry (*Vaccinium myrtillus*) near the top of Ben Wyvis, July 16th, 1908. *Mirodia schulziana*, Swordale, common, imago, June 1st, 1908. *M. palustriana*, Swordale, imago flying amongst heath, July 23rd, 1908. *Euchromia mygindana*, Swordale, imago reared June 11th, 1908. *E. arbustella*, Swordale, imago, June 26th, 1908. *Cnephasia politana*, Swordale, common, imago, May 28th, 1908; Falls of Conon, May 30th, 1908. *C. musculana*, Swordale, common, imago, May 27th, 1908. *Sciaphila virgaureana*, Swordale, common, imago, August 5th, 1908. *Bactra lanceolana*, Swordale,

abundant, imago, June 22nd, 1908. *Anchylopera unguicella*, Swordale, common, imago, May 25th, 1908. *A. myrtillana*, Swordale, imago, June 4th, 1908. *A. lundana*, Swordale, imago, June 22nd, 1908. *A. ramella*, Swordale, common, imago, August 17th, 1908. *A. cinerana*, Swordale, fairly common, imago, August 16th, 1908. *A. subocellana*, Swordale, abundant, imago, June 20th, 1908. *A. trimaculana*, Swordale, abundant, imago, August 27th, 1908. *A. penkleriana*, Swordale, abundant, imago, August, 1907. *A. naerana*, Swordale, imago, reared August 12th, 1908. *A. geminana*, Swordale, imago, reared July 30th, 1908. *Phloeodes tertraquetrana*, Falls of Conon, abundant, flying in numbers from the birch-trees, May 30th, 1908. *Hypermoecia angustana*, Swordale, imago, August 12th, 1908. *Poecilochroma corticana*, Swordale, imago reared August 7th, 1908; larvæ beaten from oak, June 27th, 1908. *P. ophthalmicana*, Camsterburn, Wick, imagines beaten in numbers from aspen, September 13th, 1908. *P. solandriana*, Swordale, common; Camsterburn, Wick, abundant, imago, September 13th, 1908. *Halonota similana*, Swordale, common, imago reared August 12th, 1908; Camsterburn, Wick, imago beaten from birch, September 7th, 1908. *H. cirsiana*, Swordale, imago, July, 1907. *H. pflugiana*, Swordale, imago, June 20th, 1908. *H. brunniichiana*, Swordale, common, imago, June 8th, 1908; Edderton, July 2nd, 1908. *Coccyx argyrana*, imago beaten from oak, Kinraig, Invergordon, June 6th, 1908. *C. taedella*, Swordale, common, imago, June 15th, 1908. *C. vacciniana*, Swordale, abundant, but rather local, imagines swarming over a patch of whortleberry on a sunny hillside, on May 31st, 1908; on returning to the same place on August 2nd, 1908, I found almost every shoot tenanted by a larva which had spun the leaves together, and was quickly turning them to brown, withered, skeletons. *Pamplusia mercuriana*, several moths flying at an elevation of 2000 feet amongst short rushes and heather, Swordale, August 6th, 1908. *Retinia resinella*, Swordale, common, several of the resinous larval abodes were found with pupæ on May 10th, 1908, imagines emerged, June 20th, 1908. *Stigmoneota perlepidana*, Swordale, flying on a sunny railway bank, May 22nd, 1908. *S. internana*, flying amongst whin (with numbers of *C. ulicetana*) in bright sunshine, Knockfarrel, Strathpeffer, June 20th, 1908. *Dicrorampha herbosana*, Swordale, common, imago, June 28th, 1908. *Catoptria ulicetana*, Swordale, abundant, imago, June 10th, 1908; larva, May 23rd, 1908. *C. cana*, Swordale, imago, June 23rd, 1908; Edderton, imago, July 2nd, 1908. *Trychiris aurana*, Swordale, imago, July 1st, 1908, fairly common. *Sinaethis pariana*, Swordale, fairly common, three moths resting on ragwort; Swordale, September 20th, 1908. *S. oxyacanthella*, L., Swordale, very common, imago, May 26th, 1908. *Eupoecilia angustana*, Swordale, the larger variety frequenting the lower ground (June 8th, 1908, June 17th, 1908) is not so abundant as the small variety which frequents heaths (July 3rd, 1908). *E. ciliella*, Knockfarrel, Strathpeffer, flying in a damp, heathy hollow, June 20th, 1908. *Argyrolepis hartmanniana*, Swordale, imago, June 20th, 1908, flying amongst damp herbage. *Aphelia osseana*, Swordale, abundant, imago, July 19th, 1908.

TINEINA.—*Diurnea fagella*, Swordale, imago, April, 1906. *Semioscopus arellanella*, Swordale, imago, March, 1906. *Incurvaria pectinea*, Swordale, imago, May 9th, 1908. *Nemophora schwarzella*, Swordale, common, Falls of Conon, May 30th, 1908. *Cerostoma vittella*,

Swordale, abundant, imagines resting amongst lichen on the trunks of elm and ash, August 25th, 1907. *Cerostoma costella*, Swordale, common, larvæ feeding on bog-myrtle, June 20th, 1908; Loch Usie, Strathpeffer, imago (reared) July 31st, 1908; beaten from elm, Swordale, August 8th, 1908. *Iphibalocera quercana*, Swordale, imago beaten from apple, August 19th, 1908. *Depressaria ocellana*, Swordale. *D. ciliella*, Swordale. *D. costosa*, flying amongst coarse grass by the sea, Nigg, August 26th, 1908. *D. heracleana*, Swordale, abundant, larvæ, July 11th, 1908; imago reared September 4th, 1908. *Gelechia ericotella*, Swordale, common, flying amongst heather, May 25th, 1908. *G. virgella (longicornis)*, Swordale, common, imago distributed from heather, May 19th, 1908. *Chelaria hübnarella*, Swordale, common, Falls of Conon, beaten from birch, October 3rd, 1908; larvæ feeding on birch, Kilmorach Falls, July 4th, 1908. *Pleurota bicostella*, Swordale, common, flying in a boggy part of the moor, June 26th, 1908. *Oecophora pseudospretella*, Swordale, abundant. *Argyresthia pygmaeella*, Swordale, common, larvæ feeding in spun-together shoots of sallow, May 19th, 1908; imago reared June 30th, 1908. *Chauliodes chaerophyllenus*, Swordale, very common, larvæ, July 14th, 1908; imago reared August 16th, 1908. *Plutella senilella (dalella)*, Swordale, common, August 12th, 1908, November 15th, 1908; Stirkoke, Wick, imago beaten from oak, September 10th, 1908. *P. maculipennis*, Swordale, common, imago, June 7th, 1908.

NOTES ON COLLECTING, Etc.

QUERY CONCERNING HADENA (MAMESTRA) PISI.—May I ask, through the medium of the *Ent. Record*, whether the larva of *Hadena (Mamestra) pisi* has ever been noted in May and fullfed in early June, the imagines appearing in August as a second brood? The coloration of such specimens is darker, the undulated line suppressed, the orbicular smaller, etc.=gen. 2 var. *aestiva*. It appears to be a distinct race that separates off from the spring brood, and appears as a partial second brood.—MAX GILLMER, 7, Elisabethstrasse, Cöthen, Anhalt, Germany.

A MISUNDERSTANDING.—Mr. Mellows desires to state that the note published (*anteà p. 187*), appeared through a misunderstanding. The note, it seems, was sent to us privately, and was not intended for publication, Mr. Holland having given the information concerning all these localities for private use. We much regret that the mistake occurred.—ED.

DOUBLEBROODEDNESS OF EUPithecia PULCHELLATA.—*Eupithecia linariata* is, of course, recorded as being occasionally partially double-brooded, but I can nowhere find the same fact mentioned with regard to *E. pulchellata*. When, therefore, in Cornwall at the beginning of July, I took two imagines, I put them down as belated emergences from last year's larvæ, and so, perhaps, they were; but, yesterday, I found in my breeding-cage a freshly-emerged specimen which is undoubtedly from a larva of this year, one of many of which I collected in Cornwall, where they were very common. By the way, the Cornish specimens seem very pale-coloured and pretty, the white being especially clean and distinct.—PERCY C. REID, Feering Bury, Kelvedon. August 7th, 1909.

OCCURRENCE OF EMMELEIA BLANDIATA IN GLOUCESTERSHIRE.—As the only records for *Emmelesia blandiata* in England appear to be from

Cumberland and Durham (once), besides one record from a southern county which Barrett quotes as doubtful, it may be interesting to note that I have taken it this year in Gloucestershire. I met with two specimens only in July, on the 12th and 20th, but since August 7th have found it rather common locally on heathy land in the neighbourhood of its foodplant, *Euphrasia officinalis*, in the St. Briavel's district. I also took one a few nights ago in my dining-room, where it was attracted by the lamp.—J. F. BIRD, Sylvan View, Brockwier, near Chepstow. *August 17th, 1909.*

COLEOPHORA CHALCOGRAMMELLA IN SURREY.—When walking through Richmond Park, Surrey, on August 14th, I noticed two small unfamiliar insects at rest on the short herbage. On getting a nearer view of them, I was intensely surprised to find that they were a pair of *Coleophora chalco grammella* in cop. This is a very distinctly marked species, and easily recognisable, but I had no idea that it occurred so far south. I was unable to discover any of the foodplant, *Cerastium arvense*, in the neighbourhood. Three days later, in the company of Mr. Henry J. Turner, I again visited the spot, but we failed to find any further specimens. The female moth was kept alive for a few days, but died after laying a few eggs.—ALFRED SICH, F.E.S., Corney House, Chiswick.

NOCTUIDS AT LIGHT.—On the evening of August 21st, 1909, I noticed a large number of moths on the shop windows in Lewisham. The greater number of those observed, however, proved to be *Triphaena pronuba* and *T. ianthina*. The latter was especially abundant, eight being observed on one window. This appears to be a species that does not usually come to light in this district. Last night (25th) it was again observed, but in fewer numbers, and apparently much worn.—A. M. COCHRANE, Lewisham. *August 26th, 1909.*

HYPONOMEUTA CAGNAGELLUS, ETC., IN LEWISHAM.—Last year (*anteà* vol. xx., p. 216) I noticed the abundance of this species in this district in early July. This year it was barely out on July 21st, but has been very abundant on the fences during the past fortnight, and is still so at the present time. The beautiful little white *Cemostoma laburnella* is also flying in great numbers; a fairly large laburnum tree in my garden has scarcely a leaf that does not show a mine of this species, and even little seedlings have been attacked as virulently; the little white cocoons are on the backs of almost every leaf.—A. M. COCHRANE. *September 3rd, 1909.*

HECATERA SERENA, ETC., ON BLACKHEATH.—Last year (*anteà*, vol. xx., p. 216) I recorded the occurrence of *Hecatera serena* on Blackheath, in July. This year, on a fence, within a few yards of the spot where the example was noticed last year, I observed another specimen on the morning of August 22nd. It was not in prime condition, as might be surmised from the late date, but it showed that the insect was still permanently fixed here. Quite close a large ♀ *Mania maura* and other common species were also noticed on the fences.—J. W. TUTT.

DICRANURA VINULA IN THE LONDON DISTRICT.—That the open spaces of London still help to preserve a large part of our lepidopterous fauna to us, is well-known. During the past week, quite a number of larvæ of *Dicranura vinula*, almost fullfed, have been taken in Meath Gardens, one of the open spaces under the control of the L.C.C., and situated near Globe Road railway station in the Bethnal Green district, the

gardens being now thickly surrounded by houses. Fifty years ago they formed part of the Globe Fields, a well-known entomological locality, and often referred to by Machin in the *Ent. Wk. Intelligencer*.—ID.

A NEW LOCALITY FOR *EREbia FLAVOFASCIATA*.—Whilst collecting butterflies on the Alp Veglia, at the foot of Monte Leone above Varzo (Simplon), my brother discovered, at an altitude of 2100 mètres, a locality for *Erebia flavofasciata*, on August 2nd. The lateness of this capture explains the poor condition of the ten examples taken, in fact, about July 10th is the best date for this species at Fusio (Tessin). The specimens from the Alp Veglia, compared with those from Fusio, are observed to show the same variability as to the width and coloration of the pale band of the hindwings below, as well as in the number and size of the spots above and below. This species, which inhabits very limited localities in the alps of Tessin and the Grisons, had not before been found in the alps abutting on the Simplon.—PROFESSOR C. BLACHIER, Geneva. *August 26th, 1909.*

VARIATION.

ABERRATIONS OF *BRENTHIS SELENE*.—On January 11th last, Mr. Grassby of Chepstow, called my attention to three interesting specimens of *Brethis selene* which were in his collection. The ground colour of the wings was white, with the usual markings. So far as I could see, the undersides were much the same as in normal specimens, and the only other difference I could observe, was that there was a blue gloss on the thorax. All seemed quite similar. They were all three taken by him on June 22nd, 1908, in the same locality, which is situated in what we may call "the Forest of Dean District," where he often goes for entomological purposes. He had never seen any similar ones there before, nor has he since, though he has searched for such. Normal specimens of this species, I understand, are somewhat abundant there.—C. A. BIRD, F.E.S., "The Nurtons," Tintern, *July 8th, 1909.*

SCIENTIFIC NOTES AND OBSERVATIONS.

GYNANDROMORPHIC FORM OF *LYCAENA ARION*.—Alar expanse of right anterior wing 21mm., of left anterior 17mm., of right posterior wing 18mm., and of left posterior 14mm. Length of right antenna 9mm., of left antenna $7\frac{1}{2}$ mm. The butterfly is of the dark mountain form, *obscura*, Christ. Ground colour of right (♀) wings is rather paler than that of the left (♂) wings, and the very sparse blue scales extend to beyond the semicircle of nearly round black spots, five in number. On the darker ground colour of the ♂ wings, three, wedge-shaped, spots only are visible when the butterfly is carefully examined by a suitable light. The black bar terminating the discoidal is as clearly marked on the ♂ as on the ♀ wings. The marking of the underside of the wings is fairly normal so far as number and position of spots is concerned. In shape, however, these vary considerably, the female wings showing large round, and the male smaller oblong, spots. Nervures normal. This butterfly, which was perfectly fresh, attracted my attention by its peculiar lopsided flight. I took it at Pralognan, in the Savoy, where the members of the Geneva Lepidopterological Society spent their summer holidays.—P. A. H. MUSCHAMP, F.E.S. *Stäfa, August 31st, 1909.*

C U R R E N T N O T E S .

Mr. E. R. Banks has confirmed the statement in Meyrick's *Handbook* that the larva of *Clepsis rusticana*, Tr., feeds on *Myrica*, larvae and pupæ having been found in bunches of spun-together shoots and leaves of *Myrica gale*, in October, 1901 and 1902, in a heath-bog in the Isle of Purbeck, the imagines appearing in early June, 1902, and May, 1903, whilst Meyrick's further statement that it feeds on " *Vaccinium*," appears to be probable, as Mr. Banks has been taking imagines between May 22nd and June 20th, 1909, at Aviemore, among *Vaccinium myrtillus*. Mr. Banks further gives a description of the full-fed larva and the pupa (*Ent. Mo. May.*).

Dr. Joy and Mr. Tomlin add *Micropeplus caelatus*, Erichson, to the British coleoptera. The species was taken sparingly at the end of April in marshy ground near Cloghane, co. Kerry, Ireland.

A most enjoyable meeting of the Entomological Club was held at Weybridge on the evening of July 5th, Mr. G. T. Porritt being the host. Many of the members and guests came down in the early part of the day for a little collecting in this well-known district, some the preceding day, but comparatively little was accomplished in spite of hard work. Supper was served at the Hand and Spear Hotel, at 6.30 p.m., when the following members and guests sat down:—Messrs. B. Adkin, R. Adkin, J. P. Barrett, H. Rowland-Brown, G. C. Champion, J. Collin, H. St. J. K. Donisthorpe, H. M. Edelsten, A. Harrison, A. H. Jones, W. J. Lucas, A. Sich, R. South, J. W. Tutt, G. H. Verrall, and C. J. Wainwright. After supper an adjournment was made to the garden; a very pleasant evening ended by the London visitors leaving about 10 p.m.

Mr. Edwards suggests (*Ent. Mo. May.*) that the light and dark specimens now combined in British collections as *Anacaena limbata*, Fab., should be treated as distinct species, the pale examples being the true *limbata*, Fab., the darker *ovata*, Reiche. The evidence is not, however, too illuminating, and one would like to know something about the earlier stages of these two insects.

Lord Walsingham describes, as *Orneodes dohertyi*, a giant Orneodid from East Africa, with wing-expanses varying from 34mm.-49mm., 43 examples having been taken in East Africa by Doherty in 1900 at Ibea.

Mr. R. Stenton records the capture on July 13th, 1909, at Herne Hill, a specimen of *Megachile willughbiella*, Kirby, the right side as far as, and including, the 3rd abdominal segment being ♀, the left ♂; the remaining terminal segments appear to be ♂, only the armature being of quite the normal form of that sex.

Dr. Wood continues (*Ent. Mo. May.*) his descriptions of new British species of *Phora*, including *Phora discreta*, *P. fusca*, *P. angusta*, *P. hirtiventris*, *P. derasa*, *P. subtumida*, *P. nudiventris*, all new to science.

Mr. J. Edwards writes on the specific distinctness of the Homoptera, *Acocephalus tricinctus*, Curt., and *A. trifasciatus*, Fab., and tabulates the most obvious distinctions between the two species.

Mr. C. Morley describes a new Braconid, one ♂ five ♀s bred by Mr. Donisthorpe on May 28th-29th, 1907, from a nest of *Formica fusca*, found at Porlock, as *Spilomma falconivibrans*. Another species is described as *Euphorus bistigmaticus*, two ♀s of which were taken, and others seen, July, 1906, hovering over a nest of *Formica rufa* at Weybridge, whilst a ♂ was bred April 13th, 1907, from an observa-

tion nest of *F. rufa*, also from Weybridge. The species was also captured at Weybridge July 5th, 1909, Bewdley, July 20th, 1909, by Mr. Donisthorpe, and in the New Park Enclosure, New Forest, August 9th, 1908, by Mr. Hamm.

The Hon. N. C. Rothschild, on the authority of Prof. A. Schmidt, notes that the larva of *Chrysoclista bimaculella* feeds under the bark of *Salix alba*. This species, so far very rare in England, was discussed in the *Ent. Mo. Mag.*, vcl. xxv., p. 169, by Stainton. At the time that we gave Stainton information concerning the specimen captured at Chattenden in July, 1886, we suggested "sallow" as the foodplant, as the example was beaten from sallow, and this seemed, judging from the analogy of the habits of the allied *C. linneella*, the most likely foodplant in this district. We gather from Mr. Rothschild's notes, that Prof. Schmidt has not yet actually bred the moth from the larva. See also *Ent. Ann.*, 1857, p. 128, and *E.M.M.*, xxviii., p. 79.

Some time since we announced the decease of Mr. F. Lemann and Mr. F. Freeman within a few weeks of each other. These two gentlemen had long been connected by entomological, as well as business, ties, Mr. Lemann capturing, and Mr. Freeman setting, the specimens and looking after the combined collection. Mrs. Freeman has now, with the greatest generosity, presented the collection to the South London Ent. and Nat. Hist. Society. It is complete in all but a few of the very rarest species, and will enable the rapidly increasing number of collectors of European butterflies in the society to name their species without undue trouble.

SOCIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
July 22nd, 1909.—ALLIED PAPILIOS.—Mr. Edwards exhibited the closely-allied species *Papilio nireus* and *P. erinus* from Africa, and pointed out the distinguishing characters. CUPIDO MINIMUS AB. MINOR.—Mr. Turner, two specimens of *Cupido minimus* from Winchester measuring only 15mm. in expanse. They were taken on June 12th with normal-sized specimens. BUTTERFLY LARVÆ AND PUPÆ.—Mr. Kaye, living larvæ of *Callophrys rubi*, and pupæ of *Celastrina argiolus*. DIMORPHA VERSICOLOR AND NYSSIA ZONARIA.—Mr. Adkin, a series of *Dimorpha versicolor*, being part of a brood from Aviemore ova; the rest were lying over in pupa. He also showed fullfed larvæ of *Nyssia zonaria* from Wallasey ova, and gave notes on their life-history. PIERIS BRASSICÆ AND SPARROW.—Mr. Adkin gave a detailed account of the persistent attempts of a sparrow to get at a *Pieris brassicae* fluttering along inside the glass roof of his conservatory. Several instances of birds attacking lepidoptera were given by other members. *August 12th, 1909.*—A NEW NOCTUID.—Mr. South exhibited a Noctuid, captured in Aberdeenshire in July, and believed to be new to Britain. PUPÆ OF NONAGRIA GEMINIPUNCTA.—Mr. Baumann, a reed containing living pupæ of *Nonagria geminipuncta* from Lewes, and an ichneumon bred from a pupa of this species. LASIOCampa QUERCUS VAR. CALLUNÆ.—Mr. Main, specimens of *Lasiocampa quercus* var. *callunae* from Westmorland. POSSIBILITIES OF TINEA BISELIELLA.—Mr. Step, a *Papilio machaon* mounted between glass for artistic purposes, which, although sealed up some eighteen months ago, had now produced a living imago of *Tinea biseliella*.

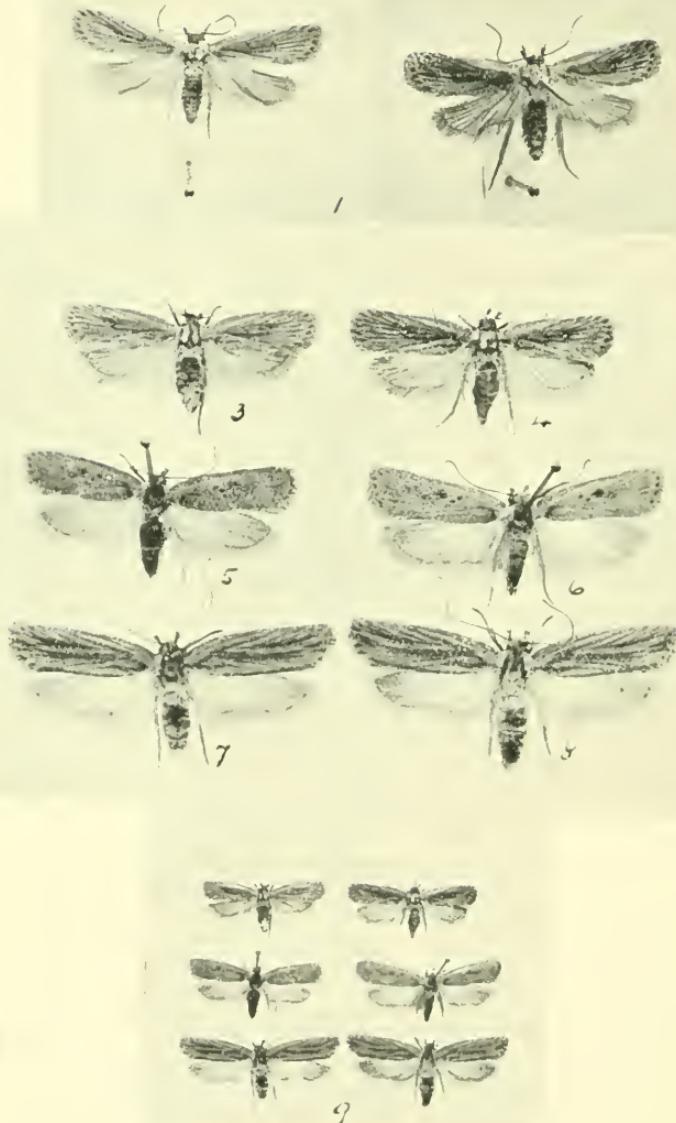


Photo. Hugh Main.

DEPRESSARIA PUTRIDELLA, SCHIFF., AND ITS ALLIES.—FIGS. 1, 2, 3, 4.—
 DEPRESSARIA PUTRIDELLA $\times 2$. FIGS. 5, 6.—D. YEATIANA, FAB. $\times 2$.
 D. UMBELLANA, STEPHS $\times 2$. FIG. 9.—SAME SPECIES NATURAL SIZE.

Depressaria putridella, Schiff.—A species new to Britain (with two plates).

BY ALFRED SICH, F.E.S.

In the summer of 1906, Mr. E. D. Green, of Lee, gathered some larvæ off umbelliferous plants growing on the Kentish coast, and subsequently bred from them several specimens of a *Depressaria* he was unable to identify. In the autumn of 1908, Mr. Green showed me the insects which were quite new to me, and he very kindly allowed me to take them for examination. In Stainton's *Natural History of the Tineina*, I found a figure and description of a continental species which agreed with Mr. Green's specimens. This was *D. putridella*, Schiff. This identification was then confirmed by comparing the specimens with the description of that species in Zeller's monograph of the genus in the *Linnaea Entomologica*, which, though written over 50 years ago, is still one of the best contributions to the study of the genus. Subsequently, Mr. Tutt and myself compared the moths with Hübner's figure, and with the specimens contained in the Stainton collection of European micro-lepidoptera at the South Kensington Museum. Owing to Mr. Green's further kindness, I was able this year to collect some larvæ myself, and to breed a few specimens. The British specimens are, as might be expected, of a form nearer to the Parisian and Austrian examples, than they are to those from the south of France, where the climatic conditions are more diverse. This species is probably an old inhabitant of Britain, but, from the very local distribution of its foodplant, has hitherto been overlooked. The Depressariids, too, are, as a rule, of very unobtrusive habits, and, probably, this species forms no exception. Some of the older British authors have used the name *putridella* in their writings, but, as will be shown later, they had not this species before them.

SYNONYMY.—Species: *Putridella*, Schiff., S.V., 138; Hb., 244; H.S., 450, v., p. 120; Zell., L.E., ix., 218; Hein., 147. Stt., Nat. His. Tin., xii., p. 192, pl. vi., figs. 3m, 3a, 3b; Nolck., Stett. e. Zeit., 1882, p. 190. *Peucedanella*, Mill., Ann. Soc. Cannes, 1880, p. 13, pl. 10, figs. 14, 15.

ORIGINAL DESCRIPTION.—Holzbräunlicher Schabe mit einem Kleinen weissen Mittelpuncke (*Sys. Verz.*, p. 138).

Hübner's figure (*Europ. Schmett.*, vol. v., fig. 244), which must be taken as the type, was evidently drawn from a very well-marked specimen, and, though the abdomen, as depicted, is more like that of a male, the wings, on account of the very dark veins and the pale ground colour, probably represent those of a female. The ground colour of the wings is very pale ochreous-brown. The veins, not accurately drawn, are dark sepia-brown, and a line of the same colour runs along the hindmargin, on which are placed six black spots. Beyond the spots the fringes are of the ground colour, terminated by a sepia-brown line. The discoidal cell is filled up with dark sepia, and, at the end of it, is a white spot. The hindwings are dull greyish-brown, with the veins slightly marked in black, and the termination of the wings and fringes shown by two sepia lines. The palpi, head, and thorax, are of the same colour as the forewings, the last having a dark brown central stripe. In this figure the palpi are too long, giving the figure a Pyraloid appearance. The subcostal vein is much too strongly coloured, and the fringes of the forewings should have been dark grey.

OCTOBER 15TH, 1909.

The veins of the forewings are only approximately drawn, vein 11 running into the apex of the wing instead of into the costa about midway. There are only eight veins shown on the left wing, and seven on the right; the black discal spots are not indicated. The brighter British examples of the female conform very well with Hübner's figure, and, doubtless, he had a specimen from Vienna similar to these before him, when he drew it. In the figure in another copy of this work of Hübner, the subcostal vein is not darkened, and the other veins are thickly, and rather confusedly, coloured.

DESCRIPTION OF BRITISH EXAMPLES OF *DEPRESSARIA PUTRIDELLA*.—This is rather a small species, and belongs to that section of the genus in which veins 2 and 3 of the forewings are stalked, or, in other words, in which the lowest vein from the cell is forked near the base. Head, thorax, and patagia, unicolorous with the ground colour of the forewings. The face always paler; second joint of the labial palpi ochreous, mixed with fuscous, usually lighter internally; terminal joint pale ochreous, sometimes with dark basal band; antennæ fuscous. Body ochreous-brown, with a fuscous sublateral stripe on each side beneath. Anal tuft of the ♂ ochreous-grey. Front and middle legs ochreous-grey, darker marked, hind legs pale ochreous on the inner side, darker, and sometimes fuscous-spotted, on the outer side. Forewings rather wide, the costa slightly arched, and the hind margin obliquely rounded. Ground colour pale ochreous-brown, purest on the inner margin and costa. Near the base a blackish transverse mark running from near the inner margin into the fold, well-defined towards the base. Outwardly, this dark mark expands into a longitudinal cloud which lies along the middle of the wing, including the discoidal spots, and sometimes runs nearly up to the apex. The veins of the wing, except the subcostal (vein 12), are very darkly marked with purplish-fuscous. On the last third of the costa, and on the extreme hind margin, is a series of eight or more black spots lying between the veins, and occasionally connected with them. In some specimens there is a short dark cloud lying obliquely across the wing before the hind margin. On the extreme base of the costa is a dark mark, and the paler parts of the wing are often sprinkled with dark scales. About one-third from the base of the wing, and situated near where vein 11 rises from the cell, is a black spot. Below this, in the cell itself, but further from the base, lies the first discal spot, usually black, often elongate. On the disco-cellular lies the second discal spot, which is very conspicuous, being black with a white centre. Midway between the two discal spots, and in a line with them, lies an usually black spot. These four spots vary much in size, shape, and in the absence or presence of white scaling, but the three in the cell are always in a line. The fringes are dark ochreous-grey, with one central paler line, and a second on the extreme margin.

The hindwings dark grey, lighter at the base, the veins somewhat darker marked; some dark spots round apex and hind margin. Fringes dark grey or dark ochreous-brown, often bisected by a paler line.

SEXUAL DIMORPHISM.—The antennæ of the ♂ are stouter than those of the ♀. The forewings are more unicolorous than those of the ♀, which, even in dark specimens, shows a greater contrast between the paler costal and inner marginal areas, as compared with the darker disc of the wing. The ground colour of the hindwings in the ♂ is darker,

and more of a dove-grey than it is in the ♀. The underside of all the wings and the fringes is darker grey in the ♂, the ♀ usually exhibiting a strong ochreous admixture in the ground colour of the underside. The anal tuft of the ♂ is distinct, but not conspicuous. In expanse, the ♂'s measure 15mm.-17mm., and the ♀'s 16mm.-18mm. The smallest specimen I have seen is a ♂, which expands 13mm.

DESCRIPTION OF PLATE XV.

Fig. 1. *Depressaria putridella* ♂ }
 " 2. *D. putridella* ♀ . }
 " 3 & 4. *D. putridella*. }
 " 5 & 6. *D. yeastiana*. }
 " 7 & 8. *D. umbellana*. } All these $\times 2$
 " 9. The same figures as 3, 4, 5, 6, 7 and 8 repeated, but
 of natural size.

(To be continued.)

A day with *Chrysophanus dispar* var. *rutilus*.

By E. M. DADD, F.E.S.

July 18th, 1909, was a sunny but windy day, but, in spite of the wind, I decided to go to Finkenkrug, as I was desirous of getting females of *Lycaena alcon*. This species is very local in the Berlin district, as its foodplant, *Gentiana pneumonanthe*, is confined to marshy meadows.

The Grosse Laake, at Finkenkrug, is one of the chief localities for the gentian, and it was here, some years ago, that I discovered the larvæ of *Adkinia graphodactyla* feeding on the gentian flowers. However, the search for *L. alcon* proved abortive, not a single specimen being seen; perhaps I was too late. *Polyommatus amandus* and *Cyaniris semiargus* were perfect wrecks, only a few possible females of *Loweia alciphron* and *Chrysophanus hippothoë* were left, scarcely a *Melitaea* was to be observed, and only the abundance of *Brenthis ino* ♀ from red to deep bluish-black compensated somewhat for one's efforts. But the wind which continued to increase in strength, soon made collecting impossible except in sheltered corners.

Having secured a fair series of *B. ino* ♀, I decided to take a look at the *Chrysophanus rutilus* ground, which is a water-meadow beside a small stream overgrown with reeds and sedges, and, generally speaking, impassable. On the way I had to traverse a small portion of bushy woodland, and here that extraordinary skipper *Heteropterus morpheus* was not uncommon; also a few *Araschnia* var. *prorsa* and *Eugonia polychloros* were about.

On arriving at the meadow where *C. var. rutilus* is to be found, I was pleased to see that it was dry enough to work, and it was not long before the first male *rutilus* was observed on a thistle-head. Meanwhile the wind so increased in power that flight was out of the question for butterflies, but, probably owing to this circumstance, I made a very good bag of the species, seven males and eight females. With one exception, they were all seated on thistle, scabious or ragwort flowers, and were so intimidated by the wind, that one could have picked them off with the hand.

Unfortunately, the males were somewhat worn, but the females were in grand condition. Besides *C. var. rutilus*, *Heodes virgaureae* was in countless numbers, and a few females of *C. hippothoë*, *Loweia*

alciphron, and *L. dorilis* were obtained. The only blue was *Polyommatus amandus*, in wretched condition.

I had the good fortune to notice a female *C. rutilus* seated on the foodplant. I presumed that she was ovipositing, and such proved to be the case. I watched her while she deposited three eggs, and then, as she was quite fresh, turned her into a specimen. The eggs were all laid on the underside of a leaf of water-dock, close to the midrib. Unfortunately, a business trip prevented me from breeding these eggs, but, as a partial second-brood is occasionally reared here in Berlin, it would no doubt have been successful.

Very little else was about on this July day, a few *Eupithecia debiliata*, *Calligenia miniata* and *Herminia tentacularia*. On the scabious heads a few *Anthrocera riciae* (*meliloti*) and *Anthrocera trifolii*, and one *A. ephialtes* ab. *peucedani*. *Syntomis phegea* was also not uncommon. I believe this species was introduced here from southern Europe many years ago, but am not sure.

Note on the value of the ancillary appendages in determining the specific value of the Hesperiines of the "alveus" group.

By DR. J. L. REVERDIN.

I have recently been led, owing to the difficulties of naming my Hesperiids, particularly those of the "alveus" group, to study the male genital armature, and I have come to the conclusion that Rambur had a clearer appreciation of this difficult subject than any of his successors, some of whom, having no knowledge of his work, have added difficulty rather than solved it. Most recent lepidopterists, at least among those known to me, admit *Hesperia alveus* to specific rank, and look upon *carlinae*, *cirsii*, *onopordi*, *fritillum*, and *conyzae*, as varieties. The examination of the ancillary appendages shows, however, that *alveus*, *onopordi*, and *fritillum* are three perfectly distinct species, that *carlinae* and *cirsii* have a different armature from those of the preceding, and on the other hand very similar to each other. I have not yet been able to obtain *conyzae*. The conclusion to which I have been led so far, is that *alveus*, *onopordi*, and *fritillum* form three species, whilst a fourth is represented by *carlinae*, of which *cirsii* is a variety (or *vice versa*). I may add that these four species form a natural group, which also includes *serratulae*. Rambur long ago arrived at exactly the same result, except that he made *carlinae* and *cirsii* two very closely allied species. What is most interesting is, that already, in 1838, this first-class entomologist, recognising that the characters of form, pattern, and colour, were insufficient to characterise the species of the genus *Hesperia*, considered that the genital armature would give better specific characters on which to determine them. In his *Faune Ent. d'Andalousie*, he described and figured the ancillary appendages of the Hesperiids long before the work of Buchanan-White and Gosse. Unfortunately this work was not finished, and it appears difficult to procure. After having applied in vain to the Swiss and German libraries, I have been able to consult it, thanks to Mr. F. Mabille, a nephew of Rambur. Naturally, at the time of the publication of the work (1838-9), the means of investigation and the instruments available for work were in their infancy, and one is less astonished that he did not discover everything, than inclined to admire how much he did see, with such

imperfect means. It is this that makes me think that the value of the works of Rambur should not remain unrecognised nor passed over in silence. The terms that he employs are not those that have since been adopted. He gives the name of "pinces" to what we call "valves," that of "stiles" to the "harpes," of "dorsal acicular piece" to the "uncus." He seems not to have recognised the "scaphium," which, particularly in the Hesperiid "alreus" group, possesses most important and well-marked specific characters.

Lepidoptera of the Grisons—Santa Maria to Munster.

By J. W. TUTT, F.E.S.

The morning of August 14th, 1908, broke cloudy, damp, and chill, at Santa Maria, and, at 10 a.m., rain was still falling, but the sky was breaking and suggested a walk down the valley. The implements of warfare were shouldered, and, in less than half-an-hour from starting, the sun had broken through the clouds and we were stealthily prowling among some willows by the side of the stream where a ♀ *Euranessa antiope* had been spotted, but, although the latter was not brought to book, a beautiful newly-emerged *Polygona c-album* was taken, and *Argynnis adippe* was observed sunning itself on the flowers still reeking with the rain of the preceding night and the early morning. The clouds, however, cleared rapidly, and the sun had soon dried the herbage. Some worn *Melanargia galathea* and fine *Erebia aethiops* tempted us from the path, and we were soon on some bush-covered ground that held us for at least five long hours, whilst the sun shone brilliantly. *Erebia aethiops* was just emerging, and was literally in hundreds, the freshly-emerged ♀s collared by the ♂s almost before their wings were dry, the latter carrying the ♀s if disturbed whilst paired, the ♀ hanging freely from the ♂. The ♀s were well-spotted, a few with five ocellated spots on the forewings, but the greater number with four, and the ♂s also appeared to be well-spotted, at least, a prolonged search failed to find any with fewer than three small spots on the forewing, whilst three well-developed ones was the usual number for this sex; the underside of the ♂s was sometimes brightly marked with a grey submarginal band, the ♀s appeared to be almost equally divided between the vars. *leucotaenia* and *ochracea*. *Epinephele lycaon* was going over, the ♂s of this species appeared to be all of that form with only one apical spot on the forewing; the ♀s were normal, the basal areas of the forewings of the darker ground colour. *E. ianira* was very abundant, the ♀s pale, but washed with rain. *Issoria lathonia* was just emerging, the specimens large, and one is a beautiful aberration with a fine black dumb-bell mark formed by the union of the two lower spots beneath the disc of the forewing and parallel with the inner margin=ab. *I. nigrum*. *Brenthis ino* had apparently been common, as well as *Hesperia carthami* and *Melitaea didyma*, but all were over, and represented now by only poor specimens, whilst, on the other hand, *Colias hyale* was only just out, the ♂s in most lovely condition, no ♀s being seen. *Heodes virgaureae* also was on the wing, not quite fresh, but the ♀s were in better condition than the ♂s. The ♀s, too, were variable, the ground colour brighter than usual in the mountains here, yet not altogether of the southern form. One specimen was exceedingly nice, the hindwings suffused, with a

submarginal series of white dots, the forewings with a submedian row of cuneate spots, the ground colour suffused only along the lower basal half of the wing, the suffusion extending above along the lower edge of the discal cell, and ending outwardly so as just to include the lower portion of the cuneate streaks, thus leaving the discal space and the outer marginal area of the brighter ground colour. *Urbicola comma* was fine in the brightness of new emergence, as also were *Polyommatus icarus* and ab. *icarinus*, *Agriades coridon*, *Coenonympha pamphilus*, and *Aricia astrache*, but *Cyaniris semiargus* was in poor condition, although the specimens taken lived for three or four days in confinement, their habits giving much interest. *Adopaea flara (thaumas)* was also going over, and only a few of the many *Argynnис adippe*, the common fritillary of the district, were worth keeping. The *Melanargia galathea* were large though worn. *Anthrocera lonicerae* var. *major* was abundant, the spots seemed particularly pinkish in colour, but, as is frequently the case, *Merrifieldia tridactyla* was the only plume observed, the common *Crambus tristellus* the only Crambid, *Lithosia lurideola* the only Lithosiid, and *Eubolia mensuraria* almost the only Geometrid. There was nothing to retain us after 3 p.m., so we walked down the valley and explored the old coaching-village of Münster, before returning to Santa Maria.

A September day's Lepidopterological observations on the Folkestone Downs.

By JAMES BELL.

The morning of September 11th, 1909, was quite bright and sunny at Folkestone, following a wet day, or rather many more or less wet and dull days. A walk over the downs, however, was most interesting entomologically, and disclosed quite a number of expected and unexpected species. The white butterflies *Pieris rapae* and *P. brassicae* were both frequent in the allotment gardens, as well as on the downs, and the larvæ of the latter in all stages of growth were most abundant, but proved later to be terribly ichneumoned only six pupæ being obtained out of some fifty larvæ. The first species observed on reaching the edge of the downs was *Coenonympha pamphilus*, very pale in colour, followed by *Polyommatus icarus*, *Agriades thetis (bellargus)*, and *Rumicia phlaeas*, all, of course, partial second-broods, and all apparently quite recently emerged. So also, was *Aglais urticae*, which was somewhat frequent. A long walk over the downs discovered little else, but this little was surprising, for it included many examples of *Hipparchia semele*, some not at all in bad condition, and *Epinephele ianira* in all sorts of conditions, many just newly-emerged, in fact, no fewer than half-a-dozen freshly-emerged ♀s paired were disturbed during the walk. Several specimens of *Eubolia mensuraria* and *E. bipunctaria* were noticed, and one or two exceedingly late worn *Anthrocera filipendulae*. The *Eubolia mensuraria* appeared to be exceptionally small, the *E. bipunctaria* particularly white.

The *Hipparchia semele* were, like the other butterflies, much attracted by the flowers of thyme and *Centaurea scabiosa*, for which also the blue butterflies showed a distinct preference. Both *Polyommatus icarus* and *Agriades thetis (bellargus)* were abundant, the ♀s of the former being especially interesting in thier variation—the form with entirely lilac-

blue wings with red marginal spots; the same form, but with darker ground colour, so that the blue is less assertive, with pale blue arches above the orange lunules of the hindwings, and pale spots to complete the usual row of orange lunules near the apex of the forewings; the blue-tinged form with pale discoidal spots, and pale arches on hindwings, and pale discoidal spots; the dark form with more purple-blue, but limited to the basal and median areas of the wings, as well as entirely brown with orange marginal lunules, except for a very faint tinge of blue at base; whilst, of the underside forms—ab. *icarinus*, ab. *semi-icarinus*, and ab. *subarcuata*, were recognised. But *Agriades thetis* (*bellargus*) was, perhaps, the most interesting species, as it certainly was the most abundant. The specimens were mostly freshly-emerged, the ♂s showing distinctly the brilliant sky-blue of the form *adonis*, and the more purple-blue of the form *bellargus*, and, as they hung from the thyme- or *Centaurea*-blossom with their wings thrown back in the sun, or chased the *P. icarus*, looking in comparison, beautiful giants, or stood with the wings almost closed, turning the hindwings alternately wheel-like, they were very beautiful objects. Many examples, too, were of the ab. *puncta*, with well-developed marginal spots on the upperside of the hindwings. The ♀s were of dark ground colour, rarely of the brown form so much more common in the second-brood in hot summers, and most were well-scaled with blue, although none of those overhauled were at all extreme in form; the orange-red lunules of some were very bright, and examples with the discoidal lunules of the forewings ringed with blue or white were also noticed. As the afternoon sun set on the slopes, the blue butterflies took up their normal position of rest, both species sitting head downwards on the grass culms or stems of *Centaurea*. The only other species observed were *Pyrameis atlanta*, which was newly out, and seemed to choose the hawthorn bushes on which to sun, and show off its brilliant colours, and two worn examples of *Melanargia galathea*, an exceedingly late date it seemed to me even for worn specimens. Not a single *Agriades coridon* was observed, and a single newly-emerged, but small, specimen of *Aricia astrarche* closes the list of species noticed. The next morning was also fine, and a stroll over much the same ground disclosed no other species, although a few almost full-grown larvæ of *Macrothylacia rubi* were picked up. No fewer than five collectors were noted passing over the ground in about an hour, and some parts of the herbage looked as if an army might have been encamped there. It is rare that one sees any scientific or other observations made by entomologists who work the ground, but this would appear to be no proof that the insects are not very closely hunted in this well-known locality.

Anthrocera exulans ab. *pulchra*, Tutt.

By P. A. H. MUSCHAMP, F.E.S.

I have taken a specimen of this beautiful insect which may be described as follows:—

Alar. expans. 34mm. Legs yellow. Thorax thinly covered with ochreous scales. Ochreous collar. Abdomen black. Anterior wings with bright orange-yellow costal edge. Orange-yellow subcostal nervure divided into two branches at the beginning of cell, the upper one again divided into three yellow branches near apex, and the lower one terminating in the centre of the wing. Orange-yellow nervure x. The whole of the wing-area is blotched together into a field of red

extending to within rather less than 2mm. from the outer border of the wing, where it is stumped down into a transparent border extremely thinly scaled with black. The lower border of the wing, that is the area contained by the nervure x and the lower edge of the wing, is covered thinly with yellow scales, not, however, so transparent, or so poorly clad as the outer border. Fringes greyish-yellow, with a dark inner line. Posterior wing entirely red, with fine dark marginal line and grey fringes. The colouring of the underside is exactly the same as that of the upperside, but rather paler throughout.

The insect described is a female. It was taken just as it was settling down to copulation. It is naturally absolutely fresh. I took it at St. Antonien in the Engadine, August 12th, 1909.

It seems to be very nearly the same insect as Mr. Tutt's ab. *pulchra* (*Brit. Lep.*, vol. i., p. 448), but I should have surmised, from Mr. Tutt's description, that *pulchra* was a form between *striata-flavilinea* and my specimen, since Mr. Tutt speaks of three long red blotches practically filling up the upper and central area of the wing. My insect has not three, but one single blotch; it is not divided by, but split up the middle by, the yellow nervure; the inner margin, instead of being green, is of the same colour as the nervure, with a slight intermixture of grey. Mr. Tutt, however, tells me that his specimen is very poorly described, that my description might have been made from his own specimen, which is also a female, and that the coloured figure I send him of the Engadine example, agrees absolutely with his Dauphiny one.

I venture to call attention to this beautiful insect, because, as everyone who is familiar with *A. exulans* must have remarked, blotching of the spots is rare, even ab. *striata*, Tutt, is only to be found here in very small numbers, I should say less than 1 per cent. The form *pulchra* was named from a single example found at Le Lautaret, and I question whether it has ever been taken since.

Lepidoptera of the Tyrol—Trafoi to Sulden.

By J. W. TUTT, F.E.S.

After spending a very dull day at Trafoi, the morning of August 17th, broke almost cloudless. It was soon determined to make Sulden our objective, and by 8 a.m. a start was arranged. This walk meant a long tramp round the northern foot of the Ortler, which was magnificent in the sunshine with a layer of fresh snow. The sun had not yet got into the Trafoi-Thal, and nothing was on the move until Gomagoi was almost reached. Here, on a sunny bank, were several interesting species, of which *Lowea aleiphron* var. *gordius*, the ♀ of quite flavescent hue, especially on the forewings and the margin of the hindwings (ab. *flavescens*), was, however, going over. *Agriades bellargus* appeared to be only just coming out, as one or two ♂'s alone were observed, but *Epinephele lycaon* was well out, and *E. ianira* common, but evidently also going over; *Pararge maera*, a very small race, was occasionally seen. On the slopes here *Hipparchia semele* was abundant, and an occasional large *Parnassius apollo* flopped from the higher slopes in front of one, but the species was not at all abundant. *Erebia goante*, too, was worn, and only a single ♀ of *Erebia euryale* was observed, fresh, the upperside well-banded, of typical form, and quite unlike the *ocellaris* race we knew so well from our previous visit to the Tyrol in 1895, yet we remember Dadd exhibiting the dark form from the

Ortler district, at a meeting of the Entomological Society of London only last autumn (1908). A number of *Issoria lathonia*, a very small race, were on the wing, sunning on the paths, and very alert; these had evidently only recently emerged, whilst *Hesperia alveus* was frequent, *Agriades coridon* and *Aricia astrache* more abundant. Here, too, *Erebia melampus* was also on the wing, and this was found abundantly also in the Suldental. *Dasydia obfuscata*, *Eubolia bipunctaria*, and *E. mensuraria*, were common on the banks, and *Cidaria populata* often noticed throughout the day's journey. There was no special abundance of "whites" observed, although *Pieris brassicae*, *P. rapae*, and *P. napi* were frequent, the latter taken in hopes of the Tyrolean form, but the ♀s, though fairly large, were quite typical, and useless to send home to Mr. Main, who wants to breed the Tyrolean race. A single specimen of the mountain form of *Melitaea athalia*, and a fine newly-emerged *Papilio machaon* with the left forewing slightly incised below the apex, fell an easy prey. In the lower part of the Suldental, one expected that insects would prove abundant. The four large fritillaries—*Dryas paphia*, *Argynnus adippe*, *A. niobe*, and *A. aglaia*—were all common, whilst one was always pleased to see fine freshly-emerged *Vanessa io* and *Pyrameis atlanta*. These, with *Agriades coridon*, *Aricia astrache*, and one or two other common species, made up the chief of the lepidoptera observed in this part of the valley, whilst *Anthrocera transalpina* was the only burnet noted. It may be advisable to record also the finding of a batch of eggs of *Dasydia obfuscata* on a leaf of *Hippophaë rhamnoides*; the eggs were laid quite upright, and close together, and, well as we knew the eggs of this species, laid in a box, it was not easy to place them, found thus wild. But the Suldental is not an entomological paradise. It is far too highly cultivated to be very productive of lepidoptera, and a long walk only resulted in a few worn *Plebeius argyrognomon*, *Lithosia lurideola*, *Merrifieldia tridactyla* (*tetradactyla*), and other species on which the British collector would look with contempt. But the scenery is delightful, and made up for much that was wanting in the collecting, and, after all, many a person travels from England to the Tyrol for the pleasure of the scenery without troubling about the butterflies. This thought is always a comfort when one feels slack in the mountains, even if the idea is a little Pecksniffian. But, just before reaching Suldental, a little patch of lucerne surrounded by a rank growth, called a halt, for here were observed examples of *Heodes virgaureae* that deserved attention; the first example taken turned out to be *Chrysophanus hippothoë* worn almost to shreds, but some of the *H. virgaureae* were, at any rate, better than this, and finally three ♂s and seven ♀s found themselves in the collecting box. The ♂s are of a bright coppery-yellow tint, one with strongly-developed discoidal lunules to the forewings; the ♀s approach the *zermattensis* form, two with the ground colour pale yellowish, the others suffused completely, with only a faint submedian transverse line on the forewing and submarginal on the hindwing, the black spots almost lost in the ground colour, and generally tending to a distinct *cuneata* form, whilst in one a row of white submedian spots is very characteristic (= var. *suldensis*). A few very worn *Plebeius argyrognomon* also occurred here, and a fine fresh dark ♀ of *Loweia dorilis* (the only specimen seen in the valley), whilst a few worn *Cyaniris semiargus*

only yielded a ♀ worth a pin for reference. Beyond the village the scenery is very fine; on the level flat laid out by the river, the mowers were hard at work, but in one or two spots *Chrysophanus hippothoë* was abundant, and many examples quite fresh. The ♂s appeared to have a somewhat yellowish tone, whilst the ♀s were all deep fuscous, with little or no trace of fulvous in the middle of the forewing. A few specimens of *Brenthis pales* sunned with them on the flowers, but this was all we noticed except a mad *Colias phicomone* or two that raced headlong down the slopes or over the meadows, and, of which, all those captured, even the ♀s, showed signs of wear.

This was the last day with the net in 1908, although I still had a week in front of me, but certain outward visible signs of an inward upset, due to what the medicals are pleased to call overwork, was startling me, and I thought it necessary to get back to see what they had to say, and so cut my holiday short. Of course, the thing I ought to have done was to have extended my holiday, instead of shortening it; however, this was not done, and the lovely day from Trafoi to Sulden finished my work with the net for the, in some ways, not altogether satisfactory summer holiday of 1908.

Cnethocampa processionea, L., as type of the genus.

By T. A. CHAPMAN, M.D.

So much has been written about this genus, and especially the remarkable habits and instincts of the larvæ, that one is loth to add a syllable to the mass. I had a brood of these larvæ, *C. processionea*, this spring, and there is one point that appears still to require a word.

In the *Proceedings of the South London Entomological Society*, 1900, p. 90, there is a note in which I described and figured the curious armature of the head and first tibiæ of *C. pityocampa*. In that note there is probably nothing new, except the explanation of the uses of these structures, and for all I know even that may not be so. They are used for tearing a slit in the strong cocoon and enabling the moth to emerge.

In Hampson's *Moths of British India*, vol. i., p. 64 (1892), these structures are entered "frons with a large corneous ridge hollowed out in front," as generic characters; *C. processionea* is quoted as the generic type.

My observations on *C. processionea* this year are to the effect that this species is entirely without these special structures. It has as smooth a frons and as simple a front tibia as any moth I know. The cocoon is of very similar texture to that of *C. pityocampa*, but has a special weak place in front, so weak that when extraneous matters (any rubbish the cocoon has been made amongst) are removed, the head of the pupa is quite visible. The moth emerges in the very ordinary way of enlarging this opening by forcing its way through, and slightly tearing the margins not by any special apparatus, but by simple pressure.

These remarkable structures, then, in *C. pityocampa*, are to be classed as specific and not as generic characters. Stephens, in his original definition of the genus, says nothing about these peculiar structures, nor does he refer to them in his description of *pityocampa*.

COLEOPTERA.

TROGOPHLCEUS SUBTILIS, Er., IN DURHAM.—In May last, when staying with my friend Mr. Bagnall, I took a specimen of this rare species on the banks of the Derwent at Winlaton Mill. During the same visit *Homalium gracilicorne* was taken under bark, and several *Agathidium badium* occurred.—HORACE DONISTHORPE. September 28th, 1909.

WICKEN FEN RE-VISITED.—My friend, Professor T. H. Beare, and I went to Wicken on September 14th for a few days, staying to collect in the Fen. Our best capture, which was the chief object of our visit, was of course *Trechus rivularis*, of which rarity three specimens were taken after much hard work. The late Arthur Chitty is the only other coleopterist who has taken it for many years. It occurred in sedge refuse. In the same way we found *Euconus hirticollis*, *Euthia scydmaenoides*, not uncommon, *Neuraphes carinatus*, *Agathidium laevigatum*, *Bythinus bulbifer*, *Conurus pedicularis*, common, and *immaculatus*, *Stilicus fragilis*, in numbers, *Ilyobates nigricollis*, *Euplectus ambiguus*, *Anchomenus livens*, *Stenus lustrator*, *binotatus*, *palustris* common, *exiguus*, *fuscipes*, and *pusillus*, *Lathrobium fovulum*, and *filiforme*, *Hypocyptus apicalis*, *Erestethus scaber*, *Silpha atrata* ab. *brunnea*, etc., etc. Sweeping in the fen produced *Chrysomela graminis*, *Stilbus oblongus*, *Phalaenus caricis*, *Galrica californica*, *Longitarsus castaneus*, *L. flavicornis*, and *Chaetocnema confusa*, in some numbers. *Cassida vibex* was swept off thistles, and *Longitarsus ballotae* was beaten off *Ballota nigra*. With the latter occurred specimens of what must be a curious small form of *Psylliodes affinis*. They are rather pale, and strongly superficially resembled the *Longitarsus*. No *Solanum*, the proper foodplant of the *Psylliodes*, could be found anywhere near.—Id.

THE GENUS *APION*.—Having this year taken *Apion stolidum* near Oxford in June, and at Ditchling with my friend Mr. Dollman in September, and *Apion affine* in the latter locality, I have now taken the whole genus myself, excluding, of course, the two doubtful species *opeticum* and *ryei*. As this is probably a record for any one single individual, I propose to write some notes on the subject later on.—Id.

COLEOPTERA NEAR CAMBRIDGE.—In the neighbourhood of Byron's Pool, Grantchester, two or three nice wood-frequenting species were to the fore. The most productive tree worked was a broken-up and much decayed elm; this produced *Xantholinus glaber*, Nord., *Quedius scitus*, Grav., *Symbiotes latus*, Redt., *Dendrophilus punctatus*, Ill., and a fine form of *Quedius mesomelinus*, Marsh., the thorax, elytra, and abdomen being of a pitchy-red colour. From a dead ash (killed by *Daucus*) near Madingley, *Hypophloeus bicolor*, Ol., *Dacne humeralis*, F., and *Mycetophagus multipunctatus*, Hellw., were taken. The *Dacne* and *Mycetophagus* occurred in great profusion among *Boleti*, within the hollow trunk. Around the margins of a large pond near St. John's College "backs," a very large number of beetles were found. The most interesting of these was undoubtedly the very rare *Harpalus obscurus*, F., one specimen of which was shaken out from decayed grass refuse in early May. Other interesting species were *Panagaeus crux-maior*, L., rarely at grass roots, *Stenolophus skrimshiranus*, Steph., in large numbers among débris close to the water's edge, *Deinopsis erosa*, Steph., not uncommon, taken by immersing grass roots, *Coccidula scutell-*

lata, Herbst, found crawling on reeds and other aquatic plants, and *Bembidium assimile*, Gyll. This *Bembidium* was by far the most common beetle around the pond, occurring in the greatest profusion.—HEREWARD C. DOLLMAN, F.E.S.

ANCHOMENUS SCITULUS, DEJ.—Having made several unsuccessful attempts to turn up this rarity in its old Thames' haunts during January, I was very much gratified in coming across it while searching flood refuse near Kew, at the end of March. Some dozen examples were secured in all, operations being summarily ended by the refuse being attended to by the municipal authorities! The refuse also yielded *Bembidium gilvipes*, Sturm, *Patrobus excavatus*, Payk., *Anchomenus atratus*, Duft. (in great numbers), and *Trogophloeus arcuatus*, Steph.—ID.

TYCHIUS POLYLINEATUS, GERM.—While collecting on Ditchling Beacon with my friend, Mr. H. St. J. K. Donisthorpe, we had the good fortune to take a specimen of this extremely rare beetle. It was taken on September 9th, by "grubbing" at the roots of *Lotus corniculatus*, our object at the time being *Tychius lineatulus*, Steph.—ID.

COLEOPTERA AT DITCHLING, SUSSEX.—In spite of continued tempestuous gales, south-west mists, and other such uncongenial items, August and September have not proved quite barren months here in Sussex. In early August, *Chrysomela orichalcia*, Müll., and its ab. *hobsoni*, Steph., occurred in some numbers at the roots of the big hemlock. By assiduous sweeping of *Achillea millefolium* on the downs, *Cassida sanguinolenta*, F., *Ceuthorrhynchus triangulum*, Boh., and *Ceuthorrhynchidius cherrolati*, Bris., were secured. The *Cassida* occurred very sparingly, the greater number of specimens taken being of the unicolorous green form. *Cassida riper*, F., swept very sparingly off thistles; *Tychius lineatulus*, Steph., several specimens swept, but always very scarce; *Litargus bifasciatus*, F., in great numbers under bark of a fallen ash. *Trachys troglodytes*, Gyll., and *Orthocoetes setiger*, Beck., rarely, by grubbing up *Lotus corniculatus*; *Ceuthorrhynchus trimaculatus*, F., taken on three or four occasions by general sweeping; *Hylesinus oleiperda*, F., in fallen ash twigs, not rare; *Necrophagus interruptus*, Steph., several examples in carrion. *Hyperaspis reppensis*, Herbst, scarce, by shaking thick moss; *Olibrus pygmaeus*, Sturm., in great profusion by sweeping *Filago*. A timber yard at Southwick, near Brighton, yielded *Lyctus brunneus*, Steph., under oak bark, and *Laemostenus* in great numbers under loose bark and stones.—ID.

SCRAPTIA FUSCULA, MÜLL., IN RICHMOND PARK.—While taking *Lyctus brunneus*, Steph., and *Paromalus flavicornis*, Herbst, from beneath bark of a large oak, I observed a small beetle running rapidly over the freshly exposed wood; this on examination proved to be *Scaptia fuscula*, Müll.—ID.

ADDITIONS TO THE APIONS PREVIOUSLY RECORDED FROM DITCHLING, SUSSEX.—*Apion schönherri*, Boh., very scarce—I have only taken some half dozen specimens by sweeping herbage. *Apion stolidum*, Germ., by sweeping the leaves of *Chrysanthemum leucanthemum* in a meadow. Occasional examples were swept up as late as September 20th. *Apion waltoni*, Steph., found in great plenty by pulling up, and sweeping, *Helianthemum* and *Hippocrepis comosa*: I have not been able to associate it with thyme. *Apion affine*, Kirby, very local indeed, but in some numbers where found. Taken by sweeping long grass on Ditchling

Beacon, but restricted to two valleys as far as I have yet ascertained. I was interested in taking *Apion pubescens*, Kirby, in some numbers at the roots of *Filago*: previously, only odd specimens had turned up by sweeping long grasses.—Id.

COLEOPTERA AT RUISLIP RESERVOIR, MIDDLESEX.—While searching for *Lathrobium filiforme*, Grav., among reed débris and rotten wood in January, I took several examples of *Lathrobium punctatum*, Zett. In company with Mr. Donisthorpe, I made another outing in April; the best captures were:—*Anchomenus livens*, Gyll., from thick moss; *Erirrhinus scirpi*, F., among reed stems, and *Rhinoncus gramineus*, F., by sifting dead leaves, rotten wood, and humus mould.—Id.

NOTES ON COLLECTING, Etc.

LEPIDOPTERA IN THE TEIGNMOUTH DISTRICT.—The continuation of my collecting notes (*anteà* pp. 186-187) will, I am afraid, prove disappointing reading, for the entire month of June was exceedingly wet, cold, and miserable, consequently but little out-of-door work could be indulged in. Having a large number and a great variety of larvæ feeding, however, I was kept quite fully occupied, but one thing that struck me very forcibly, when gathering food for them, was the number of dead larvæ that were met with under the hedges and trees. At first, I thought this mortality must be due to the attack of ichneumons, but, in examining various specimens, I found no trace of any such cause, and consider now that it was due to the inordinate quantity of honey-dew on all leaves and plants. This was more noticeable, perhaps, in July. Larvæ of *Cerura vinula* and *Notodonta ziczac* were in great force on sallows this year, and the former I picked up dead, three-parts grown, in numbers. It seems to me that *Euchloë cardamines* and *Callophrys rubi* were the most abundant of all the butterflies except *Pieris brassicae*, *P. rapae* and *P. napi*. Strangely enough, although I only saw two ♀s of the first-named, yet I came across the larvæ on taver-mustard in numbers wherever that plant grew. Webs of *Lachneis lanestris* were more plentiful than ever this year, in some parts nearly every blackthorn bush was adorned with a web, but the majority of the larvæ were drowned. About the middle of July, *Cidaria picata* was the most plentiful Geometrid (except *Melanippe montanata*, *M. rivata*, *Cidaria associata*, *Eubolia mensuraria*), whilst *Melanthia unangulata*, *Acidalia emarginata*, *Ephyra porata*, and *E. punctaria*, were well represented. Mullein plants, as well as figwort, were crowded with larvæ of *Cucullia verbasci*; bladder-campion yielded larvæ of *Eupithecia venosata*, *Dianthoecia carpophaga*, and, I presume, *D. cunebali*, although the larvæ may be those of *D. capsincola*?, in astonishing numbers. During the first week in August, *Eugonia polychloros* was to be met with in goodly numbers. This is an insect that rather puzzles me down here, as, for some seasons, one will not meet with a single specimen, and, the next, one will find the broods of larvæ on sallow and elm quite commonly. *Lithosia lurideola*, *L. griscola* and its var. *stramineola*, and *Calligenia miniata*, were plentiful all through this month. *Lithosia caniola* appears to be practically worked out in this neighbourhood, and I only know of very few taken here this season. Perhaps burning the herbage along the cliffs may account for this, however. The “mere collector” must not be blamed for everything!

Eupithecia subfulvata was not uncommon. Towards the end of the month *Callimorpha hera*, *Bryophila muralis*, and *B. perla* were in evidence, whilst on the same walls that produced the two last-named, were numbers of *Luperina testacea*, but the range of variation was small. Toadflax being unusually abundant this year, the larvæ of *Eupithecia linariata* were correspondingly common. I found that one bagful of this plant produced 257 pupæ, when I turned out the cage recently, although I did not actually see a single larva when I collected it. Up to the present I have seen no *Colias edusa*, nor has a nightly watch on a patch of *Nicotiana* revealed *Agrius convolvuli*. One morning in June, I beat several imagines of *Nudaria mundana* from a mixed hedge of hawthorn, oak, and maple, but am somewhat at a loss to guess on what the larvæ could have fed there, as lichen was conspicuous by its absence, and there are no walls or trees near, only young growth.—ERNEST A. ROGERS, Kabul House, Teignmouth. September 23rd, 1909.

HECATERA SERENA AND OTHER LEPIDOPTERA AT LIGHT AT WEST NORWOOD.—On August 15th, a freshly-emerged ♂ came in to light at Upper Norwood. I have taken odd specimens at sugar and light in the neighbourhood for the last three years. We may conclude from this, and the record in the September number (*anteà* p. 217), that this species lingers in the suburbs, despite the extension of bricks and mortar. It may be as well to record also the following interesting captures: July 31st, *Iodis vernaria*, ♀; August 11th, *Apamea ophiogramma*, and *Calymnia pyralina*; August 13th, *Characæs graminis*. The insects were all attracted by an electric bulb let down in front of an open window, and a looking-glass placed behind it, the space illuminated being the ordinary garden, about 60 yards long, and surrounded by similar gardens.—B. HAROLD SMITH, F.E.S., Edgehill, Warlingham, Surrey. September 27th, 1909.

DASYPOLIA TEMPLI AT SWANAGE.—With reference to Mr. Leonard Tatchell's note under the above heading (*anteà* p. 187), *Dasypolia templi*, though usually uncommon, cannot accurately be called "of rare occurrence" in the south of England, as he supposes it to be. I have notes of various captures made in several localities on the Dorset coast, and, in 1895, eleven specimens were reared from larvae found by a friend and myself in the neighbourhood of Swanage. In *Lep. Brit. Isl.*, iv., 293 (1897), Barrett writes: ". . . . but it is found, sometimes not rarely, in the Isle of Wight, at Weymouth, Portland, Poole, and Chickerell, on the coast of Dorset; near Exeter, and from Torquay to Plymouth on that of Devon; at Land's End, Cornwall; in Somerset, Gloucestershire" Besides the above-mentioned Dorset localities, the species has also been recorded from Charmouth in the same county. Mr. Tatchell's note, however, affords one fact of peculiar interest, in that he took his Swanage specimen of *D. templi* "at sugar," whereas Barrett (*loc. cit.*) specially remarks that the moth, though readily attracted by a strong light, "is not known to frequent flowers or to pay attention to sugar or food of any kind."—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. August 3rd, 1909.

MANDUCA ATROPUS AT SWANAGE.—I had the good fortune to obtain an imago of this species, on September 29th, in a potato field near here.—LEONARD TATCHELL, "Karenza," King's Road, Swanage. October 3rd, 1909.

STAUROPUS FAGI IN LEIGH Woods.—On September 18th I beat from the small-leaved lime in Leigh Woods a full-fed larva of *Stauropus fagi*. It seems well to place this capture on record as occurrences of this larva, in this locality, are very rare. Mr. R. Ficklin beat a larva in 1877, and Mr. W. N. Grigg informs me that he once captured some larvæ, also feeding on lime. This tree does not seem to be mentioned amongst the recorded foodplants, but the beech is one of the most uncommon trees in Leigh Woods.—GEO. C. GRIFFITHS, F.E.S., Penshurst, 3, Leigh Road, Clifton, Bristol. *October 5th, 1909.*

FOODPLANTS OF STAUROPUS FAGI.—By far the best account of the life-history of this species published so far, is, in our opinion, that by Mr. A. F. Bayne, *Ent. Record*, iv., pp. 29-38, the facts from which, although borrowed largely by more recent authors, not always with acknowledgment, appear to have been overlooked by many lepidopterists specially interested in this species. Bayne writes (*op. cit.*, pp. 31-32) of the foodplants of the larva :

Foodplants of Larva : From the number of foodplants given by various authors, *S. fagi* would appear to be a general tree-feeder. Stephens gives (*Illus. Brit. Entomology*) beech, oak, hazel, birch, lime, alder, and sloe. Bernard-Smith (*Notes on the Notodontidae*), oak, beech, hazel, and birch, and adds that they "have even occurred on wild rose and hawthorn," and "will thrive well on apple." Holland mentions (*Ent. Record*) that he finds them "mostly on beech, but some on birch and oak," and also records that some larvæ he was keeping "fed up well, sleeved on apple." Godart suggests (*Hist. Nat. des Lépidoptères*) that it may feed on elm, as he has twice found the larva at the foot of that tree. We have beaten them from beech, oak, and sallow, and fed up our larvæ on beech, which keeps very well if the branches are put in bottles of water.

It will be seen, therefore, that the foodplants are very varied, and that "lime" was recorded by Stephens at least as far back as 1828.—J. W. TUTT.

W A R I A T I O N .

RUMICIA PHLEAS AB. ALBA, TUTT (SCHMIDTII, AUCT.).—On August 28th, one of the few very fine days of the present autumn, in the course of a long walk across the various "Charts" from Oxted towards Seven-oaks, I had the extreme pleasure of seeing a perfect specimen of the above rare form, sunning its wings in a rough field on the Brasted Chart. Needless to say I annexed it. It is a ♀, and is a representative of the ab. *alba*, Tutt. For years, as Mr. Tutt has pointed out in his *Nat. Hist. of Brit. Butts.*, vol. i. (viii.), p. 355, all the light-coloured aberrations have been lumped together as *schmidtii*, whereas this latter name refers properly only to the straw-coloured form.—H. J. TURNER, F.E.S., 98, Drakefell Road, New Cross, S.E. *September 19th, 1909.*

URAPTERYX SAMBUCARIA AB. CUSPIDARIA, N. AB.—On July 26th, at dusk, I netted, at Brockweir, a very handsome specimen of *Urapteryx sambucaria* ♂. The colour and markings are perfectly normal, but the outer margin of the forewings extends into a decided tooth at the third median nervule, so that they are, in a way, similar in outline to those of *Macaria notata*, but the "cusp" is a little more decided and pointed, both forewings being perfectly symmetrical. On looking at the specimens of this insect in our cabinet, I find that several show, in varying degree, a slight indication of a cusp, but none so pronounced

as the example I have described above, which I think deserves a varietal name, so propose to call it ab. *cuspidaria*, n. ab.—J. F. BIRD, Sylvan View, Brockweir, near Chepstow. *September 13th, 1909.*

ABERRATIONS OF *POLYOMMATUS ICARUS*.—When I re-visited the locality referred to *anteā* p. 211, a grassy hollow near the village of Munden, Herts, again, on September 1st, I found a numerous second-brood of *Polyommatus icarus* on the wing. I succeeded in capturing a ♀ *icarus* with a beautiful violet-blue ground colour. There were large prominent black spots round the margin of the hindwings, but over these only cloudy traces of the usual red and black markings remained, so that the hindwings came very near exhibiting the ♂ facies (black-spotted variety). Also on the forewings the red spots are absent, leaving only a rusty shade in the black margin. On the next day I captured four fine ♂'s, almost pure blue in colour. One, a transition form to my capture of June 13th, had traces of black spots on the hindwings (upperside), and one other was distinguished by a dark grey underside, somewhat like that of *A. bellargus* ♂. This specimen had a startling resemblance to *Agriades bellargus* in flight by its colour mixture of sky-blue upperside, and dark grey underside. Of ab. *icarinus* I captured two ♂ specimens; of ab. *arcua* only one ♀ came under my notice, but I also took a ♂ which showed the corresponding spots of the hindwings enlarged and united by an arc.—T. REUSS, Libury Hall, Ware, Herts. *September 6th, 1909.*

SCIENTIFIC NOTES AND OBSERVATIONS.

NOTE ON *SERICORIS MICANA*.—In the course of his interesting notes on the "Habits and Habitats of *Melitaea aurinia*," published in *Ent. Rec.*, xix., 273 (1907), Mr. George Wilkinson writes, "The fourth (*i.e.*, the fourth field.—E.R.B.) was the "micana" field; I have seen hundreds of *Sericoris micana* flying here, and at such times one has only to sweep the net around, and then pick out the good specimens; the females are much larger than the males." Mr. Wilkinson will, I hope, forgive me for calling in question the accuracy of this last statement, but it appears to be founded on some misapprehension on his part, for the females of *S. micana*, instead of being "much larger," as he asserts, are, on an average, *much smaller* than the males. I possess altogether 67 males of this species, but only 5 females, the latter sex being remarkably scarce in British collections. The following measurements may be of interest: *alar. exp.* (corrected where the specimen is not set flat), of largest ♂ = 19mm., of smallest ♂ = 15.5mm.; of largest ♀ = 14.3mm., of smallest ♀ = 13.5mm.; and this same marked difference in size between the sexes has been noticeable in all the collections that I have studied, where both males and females have been represented. In the late Mr. S. J. Wilkinson's "British Tortrices," p. 268 (1859), the *alar. exp.* of the ♂ of *micana* is given as 8 lines, whilst on the following page the average size of the ♀ is incorrectly given as being also 8 lines. In his *Lep. Brit. Isl.*, xi., 52 (1906), however, Barrett says, "Expanse ♂ $\frac{3}{4}$ in. (mm.) [in error, probably, for "17mm.-19mm.," though Barrett's precise equivalent in mm. for his approximate " $\frac{3}{4}$ in." varies a little in the case of different species—E.R.B.], and then correctly adds, "Female decidedly smaller, but stouter, the colour and markings more bright and glistening." If Mr. George

Wilkinson would allow me to examine a couple of examples of both his reputed male and female *S. micana*, I should be pleased to report upon them, and have no doubt that the mystery surrounding his captures would be speedily solved.—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. *September 10th, 1909.*

POLYOMMATUS SAPPHIRUS, MEIGEN—*P. ESCHERI*, HÜBNER.—There is no doubt that the conclusion arrived at by Mr. Tutt concerning this matter (*antea* p. 202) is correct. In the *Stett. Ent. Ztg.*, xii., pp. 309-10 (1851), Keferstein had already determined *Polyommatus sapphirus*, Meig., as synonymous with *P. escheri*, Hb., although the latter is erroneously treated as a variety of *Lycaena alexis* (= *L. icarus*). Here he writes:—

Var. a.—*ESCHERI*, Fr., Hb., 799-800, 867-868 ♀, Godart, suppl. i.-ii., pl. xi., figs. 3-6, Bsd., pl. xii., figs. 4, 5D.

Medon, Esp., tab., xxxii. (supp. viii.), fig. 1. *Sapphirus*, Meigen, tab. xvii., fig. 4.

—MAX GILLMER, 7, Elisabethstrasse, Cöthen, Anhalt, Germany. *September 19th, 1909.*

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

STRANGE EGGLAYING OF *ARCTIA VILLICA*.—Yesterday, whilst searching fir-trunks near here for *Boarmia repandata*, etc., I noticed a batch of ova laid about 20 feet up, and, on climbing up, found that it was a batch of ova of *Arctia villica*. Is not this a rather unusual position for this insect to choose? I have often found similar batches of ova on leaves of various low plants, and once on a piece of slate lying on the ground, but have never noticed them high up a tree-trunk before.

—ERNEST A. ROGERS, Kabul House, Teignmouth. *July 2nd, 1909.*

EUPITHECIA FRAXINATA, CREWE.—As there is some use, as well as pleasure, in verifying older records, I report that I found eggs of this species not uncommonly on *Coriaria myrtifolia* at Vernet-les-Bains in early May, 1909. The larvæ from these were typical *E. fraxinata*, long, slender, green, with a little yellowish on the well-marked lateral flange, well-marked, that is, until being full-fed, the larva becomes round and plump, and the purple-red anal patch, the remainder of a red dorsal line being in doubtful evidence. Two moths emerged here, one at the beginning, the other in the middle, of September; they would probably have come out earlier in the Pyrénées-Orientales. Millière records in the *Iconographie*, iii., p. 111 (1896), that he found these larvæ in June, 1863, on the same plant at Amelie-les-Bains (no great distance from Vernet-les-Bains). The following is a description of the larva:—

Long and slender 18mm.-19mm. long (or even 21mm. when stretched), 1·4mm. wide, 1·3mm. thick, the greater width due to a very pronounced lateral flange along all the abdominal segments. Of a green colour, very difficult to see sometimes on the food; one larva was believed, for some minutes, to be somehow lost, though the scrap of food-plant it was on was examined over and over again; it was found by rubbing and shaking it off. The head is rather paler; the lateral flange has some yellow, more evident towards the latter segments. On the dorsum of the last segment is a pink patch involving most of its area. The abdominal segments appear to be divided into five nearly equal subsegments, the two last faintly subdivided. The appearance varies a good deal by attitude, and the 3rd and 4th subsegments seem, at times, to be one large subsegment. Rather younger the yellow of lateral line is nearly white. Yellow lateral line on the 1st and 2nd thoracic segments, and a very

narrow yellow line along front of prothorax. The dorsum is a darker green and more free from the minute pale hair-points that are abundant between it and the lateral flange; these carry no visible hairs, but there are several very minute black hairs, apparently those of the ordinary primary tubercles.

—T. A. CHAPMAN, M.D., Betula, Reigate. *September, 1909.*

NOTES ON THE LARVAL HABITS OF *MELITÆA ATHALIA*.—The ova which are of a pale lemon colour, hatched in from 13-16 days. The larvæ fed in a web on the leaves of a living plant of narrow-leaved plantain, and, after moulting twice, settled down on September 3rd for hibernation in the folds of the leaves covering their food, in companies of from five to fifteen. On March 21st of the following year, they started wandering about outside their hybernacula, basking in the sunshine; the next few days being cold and dull, they re-entered the same, appearing again on April 2nd, starting to feed on the 4th. They only move about and feed when the sun is shining, returning at night to their hybernacula. These larvæ moulted on the 6th and 21st of April, and finally on May 3rd. They became less and less gregarious after each moult, and started pupating May 14th, remaining 17-23 days in that stage.—E. C. Joy. *September, 1909.*

CURRENT NOTES.

As an outcome of examining the structural details of *Celastrina argiolus* in order to determine the specific and varietal values of certain insects which had been referred to this species by various authors, and that some approximately accurate result might be arrived at in our treatment of the species in *A Natural History of the British Lepidoptera*, vol. ix., Dr. Chapman felt constrained to enlarge the scope of his studies, and to examine the ancillary appendages of as many Celastrinids as were available, and has now published, in a paper entitled "A review of the species of the lepidopterous genus *Lycaenopsis*, Feld. (*Cyaniris* auct. nec Dalm.), an examination of the male ancillary appendages" (*Proc. Zool. Soc. Lond.*, pp. 419-476, August, 1909).

It would appear that Butler catalogued (*Ann. Mag. Nat. Hist.*, 1900, p. 441) under the name of *Cyaniris*, 60 species, of which 57 were Cyanirids (in Butler's sense, *i.e.*, our Celastrinids) and 3 doubtful, to which have since been added others that bring the apparent total of species to 66. Of these, two species are Everids, and belong to an entirely different Lycaenid group, four others are probably outlying Celastrinids, and eight have not been examined, whilst the examination of the ancillary appendages of the remaining 52, has resulted in the establishment of 30 species, and 22 varietal forms of one or other of these 30 species. The ancillary appendages of these species (and a few others discussed) are illustrated by 72 text figures, photographed by Mr. F. Noad Clark. The ancillary appendages of the 30 species collected thus under the name *Lycaenopsis*, show all the salient characteristics that have been already described by Dr. Chapman (*Nat. Hist. Brit. Lep.*, pp. 383 and 390-391), but exhibit great range of difference *inter alia*. Some of these, however, appear to group themselves fairly naturally, *e.g.*, (1) *argiolus*, *puspa*, etc., (2) *haraldus*, *ripte*, etc., (3) *corythus*, *shel-fordi*, *nedda*, *acesina*, *phillippina*, etc., (4) *albidisca*, *marginata*, *limbata*, *cardia*, *dilecta*, *cossaea*, *lanka*, *roma*, *drucei*, *akasa*, *camenae*, *dilectissima*, etc., and so on; others seem to be somewhat peculiarly isolated, *e.g.*, (1) *transpecta*, (2) *albocaerulea*, etc.

To properly group the species, however, requires a knowledge of their life-histories, and a prolonged study of all the characters offered by the various stages in order to see how far the different characters support the genitalic grouping. Without any real knowledge of the characters here noted as desirable, we have already (1906) separated group 1, *argiolus*, *puspa*, etc., as *Celastrina*; whilst Felder, considering *haraldus* "not congeneric with anything else," called it *Lycaenopsis* (1865). We are not aware whether other authors have provided names for groups 3 or 4, nor are we at all sure that it would be considered desirable in the present stage of our knowledge. Dr. Chapman has treated them all as one group, applied Felder's name (type *haraldus*) to the whole of the group, and leaves to some later student who may work it from another standpoint, to further break it up if he finds characters that agree with the groups suggested by the ancillary appendages, and thus support the subdivision.

Some day, perhaps, we may get a revision of the Celastrinids in their widest sense, including *Zizera* (*maha*, etc.), ? *Notarhrinus*, *Neopithecops* (*zalmora*), etc. Dr. Chapman has done the collar work for this future piece of study excellently; he has shown many supposed species to be only forms of others, to which their relationship was not expected; he has given easy means of defining species (except in the puzzling *directa* group), he has given a definition of the Lycaenopsids or Celastrinids in their wider sense, and turns out some species hitherto considered to belong to the group; his paper is a clear, concise, and masterly summary, and is only not more extensive, because, whilst he has been at work on this, the present writer has asked his assistance in a dozen other directions—Everids, Agriadids, etc.—and, forgetful that there are only 24 hours in the day, now gives the most unkindest cut of all, by following up his crude criticism of his friend's work with the Oliver Twist gasp for "more," always "more."

The third volume of the *Bollettino de Lab. di Zoologia Generale e Agraria d. Portici* has just come to hand, and maintains the high position attained by its predecessors. Papers on "Parasitic Hymenoptera," by F. Silvestri, "Chalcids," by L. Masi, "Thysanoptera," by P. Buffa, "Material for the study of the *Hispidae*," by R. Gestro, an exhaustive account of "*Dicranura vinula* and its parasites," by G. Martelli, are only indications to some of the chief papers published in this excellently printed and illustrated journal.

In the *Int. Ent. Zeits.*, iii., p. 140, Noack records the capture of a gynandromorph *Lymantria monacha* near Stettin, on August 24th. The left side is ♀, 26mm. in wing-expansile, of the typical *monacha* form; the right side is ♂, 22mm. in wing-expansile, of the form *eremita*; the antennæ, thorax, and abdomen are divided bilaterally like the wings.

A very interesting personal note occurs in the current number of the *Canadian Entomologist*, to the effect that the late Mr. W. H. Edwards, finding himself without the necessary funds to publish the third volume of his *Butterflies of North America*, contemplated offering his collection of North American butterflies to the Trustees of the British Museum, in order to secure the money to enable him to go on with his work. To prevent the types of his species going out of America, Dr. W. J. Holland offered to pay the bills for the publication of the third volume of the *Butterflies of North America* as they became

due, on the condition that the collection should be handed over to him when the studies were completed. This was done, and to-day Edwards' entire collection forms a part of Dr. Holland's own private collection, which is now deposited in the museum of the Carnegie Institute, in order that it may be made available with other collections for purposes of study on the part of students.

Whilst fully appreciating the public spirit of Dr. Holland, it does seem pitiful to think that the best work ever done by an American lepidopterist, was so ill-supported by the entomological public for whom it was written, that the author not only had to give his life's work as a labour of love, but also had to part with his collection, with all its personal and sentimental ties, in order to give to an entomological world work that it could not even appreciate to the point of paying for the actual mechanical labour expended by printers, lithographers, etc., in its production, an entomological public that took, in addition, without payment, the years of labour spent by the author, in amassing material, breeding and curating the specimens, describing their early stages, etc. Such work is sometimes called, as we have called it above, a labour of love. This may be excellent sentiment, but it appears to us also to be amazing nonsense in such a case as this. A labour that ended in Edwards handing over his collection under the conditions above described, must have sapped his entomological life's blood. No wonder we read in the notices of his death in the American magazines that, for the last 20 years of his life, Edwards gave up the study of entomology, and took to the study of Shakesperian literature. Dr. Holland's statement allows us now to picture clearly what entomology lost by the failure of individual entomologists to support the best work on lepidoptera that America ever produced. Possibly, at least, two more volumes like the others might have been produced, had they both been supported, and in their place we have a wordy warfare as to how Shakespeare's name ought to be spelt!!

Dr. Sharp adds (*Ent. Mo. Mag.*) *Lacobius scutellaris*, Motsch., to the British fauna. The first British example was taken by Mr. Champion at Chobham, September 22nd, 1878, the second by Dr. Sharp at Brockenhurst during the past summer. *L. scutellaris*, Motsch., is most nearly allied to *L. sinuatus*, Motsch., but is much darker than any other *Lacobius* found in England.

Mr. J. Edwards describes *Dryops (Parnus) anglicanus*, as a species new to Britain, and to science. It is said to be similar in appearance to *D. griseus*, Er., but the species is really founded on genitalic differences when compared with those of *D. auriculatus*, Fourc. The specimens on which the species is founded, are noted as having been taken at Horning, in May, 1888, when *D. auriculatus* was also taken, and was found again in the same locality during the present year.

Mr. E. R. Banks describes (*Ent. Mo. Mag.*) the larva and pupa of *Eretria (Retinia) sylvestrana*, Curt., and gives some interesting notes on the larval habits.

Mr. Kenneth J. Morton adds *Limnophilus fuscinervis*, Zett., to the British Trichopterous fauna, from examples taken near Castlebar (co. Mayo) on June 17th last, by Mr. J. N. Halbert.

Mr. Malloch adds three species of Diptera to the British list—(1) *Cnemacantha muscaria*, Fln., captured June 9th, 1906, at Bonhill, Dumbarton. (2) *Eccoptomera ornata*, Lw., taken at Oxford, in July,

1909, by Mr. Hamm, and at Logie, in July, 1908, by Dr. Sharp. (3)
Pegomyia scitenstettensis, Strobl, common in one spot at Bonhill.

An "African Entomological Research Committee," has been appointed by the Earl of Crewe, with "the object of furthering the study of Economic Entomology with special reference to Africa"; the Earl of Cromer will act as chairman. The committee is constituted as follows:—Colonel A. Alcock, C.I.E., F.R.S., London School of Tropical Medicine; Mr. E. E. Austen, Natural History Museum; Dr. A. G. Bagshawe, Director Sleeping Sickness Bureau; Dr. J. Rose Bradford, F.R.S., Secretary Royal Society; Colonel Sir David Bruce, C.B., F.R.S.; Dr. S. F. Harmer, F.R.S., Keeper of Zoology, British Museum; Dr. R. Stewart MacDougall, Entomological Adviser, Board of Agriculture; Sir John Macfadyean, Royal Veterinary College; Sir Patrick Manson, K.C.M.G., F.R.S.; Mr. R. Newstead, Liverpool School of Tropical Medicine; Dr. G. F. Nuttall, F.R.S., Quick Professor of Biology, Cambridge; Professor E. B. Poulton, D.Sc., F.R.S., Hope Professor of Zoology, Oxford; Lieut.-Colonel D. Prain, C.I.E., F.R.S., Director Royal Botanic Gardens, Kew; Mr. H. J. Read, C.M.G., representing the Colonial Office; The Hon. N. C. Rothschild; Dr. D. Sharp, F.R.S., Dr. A. E. Shipley, F.R.S., Cambridge University; Mr. S. Stockman, Chief Veterinary Officer, Board of Agriculture; Mr. F. V. Theobald, Agricultural College, Wye; and Mr. C. Warburton, Cambridge University. Mr. A. C. C. Parkinson, of the Colonial Office, is acting as Secretary to the Committee, and Mr. Guy A. K. Marshall as Scientific Secretary.

Arrangements are now being made to send out two entomologists to East and West Tropical Africa respectively, with the intention of stimulating local research, and of affording expert instruction in scientific methods. Although, essentially, the Committee will have to do with the application of entomology to medicine, agriculture, etc., one supposes a fair amount of pure scientific entomology must result.

It was with the greatest regret that we recently observed, in one of the German magazines, a notice of the death of Lajos Aigner-Abafi, the well-known Hungarian lepidopterist, in June last. We have been so indebted to him for information about the Hungarian forms of our British butterflies during the last few years, information that we hope has been of use to all those advanced lepidopterists who use our *Natural History of British Lepidoptera* for reference, that we feel as if we have lost a personal friend. We knew that he was in ill-health, but had no idea that his illness was likely to terminate fatally. His work in connection with the *Rovartani Lapok* is too well-known to need more than passing mention here.

So well do the British entomologists know the greater number of European butterflies, and so easily can they be named by reference to the better-known private collections, or to the national collection at the Natural History Museum, where the cabinets are always at the disposal of students for this purpose, that, when Wheeler wrote his *Butterflies of Switzerland*, he did not even think it worth while to describe the usual type, let alone give figures of the species. But, with the continental Noctuids and Geometrids, the matter is entirely different. Few Britishers have got any real grip of the European species, and hardly anyone can name at sight all the species picked up in an ordinary trip on the continent. A book, therefore, with all the species well-figured, correctly named, and with sufficient catalogue

descriptive letterpress for reference, would be sure to aid the collector in coming to a correct and accurate conclusion as to his captures. That these figures should be well and accurately done, goes without saying, if the allied species of *Agrotis* among the Noctuids, or those of *Acidalia* and *Eupithecia* among the Geometrids, are to be correctly identified.

Probably no collection in the world is more complete, or more accurately named, than that of Mr. Oberthür, and we have already drawn attention to the marvellous ability of Mr. Culot to represent in colour-work the details of our lepidoptera. It is, therefore, with great pleasure that we learn that Mr. Oberthür has placed at the disposal of Mr. Culot his collections, and that the latter has determined to produce in monthly or bimonthly parts a work entitled "Iconographie des Noctuelles et Géomètres d'Europe," each part to contain two plates and a corresponding amount of letterpress, and to be published at 3·50 francs per part. The first part published is excellent in the execution of the hand-coloured plates, and the design of the work. Of course, the success of such a work must depend on the number of general subscribers, however much aid is forthcoming from a few more wealthy lepidopterists. At any rate we would plead that British lepidopterists should give their support to so desirable a work as the projected one promises to be. We cordially recommend, therefore, the work to their notice, and would suggest that those interested should send for pt. 1 to Mr. Culot, Villa-les-Iris, Grand Pré, Geneva, when they will be able for themselves to judge of its excellence.

Mr. F. Enock records the detection of a wheat-pest, *Clinodiplosis equestris*, Wagner, near Tenby, in August, 1908.

Dr. Chapman notes (Ent.) that *Soldanella alpina*, as well as *Androsace vittiana*, both belonging to the *Primulaceae*, is a foodplant of the larva of *Latiornia orbitulus*.

Mr. F. E. Blaisdell has published through the Smithsonian Institution "A monographic revision of the Coleoptera belonging to the Tenebriode tribe *Eleodiini* inhabiting the United States, Lower California and the adjacent islands." The work seems to be especially well-done, but, like many other entomologists who find their knowledge expanding beyond the accepted terminology, and who yet maintain the necessity of a binomial nomenclature consisting of a generic and specific name, Mr. Blaisdell divides his genus *Eleodes* into named subgenera, with full diagnostic details, subdivides these again into diagnosed groups, and thus comes to a sort of quaternary nomenclature by the time he reaches the species. His subgeneric names then seem to be dropped, and he describes the species under the old group name *Eleodes*, the binomial used not offering the slightest suggestion as to the position of the species in any one of the eleven subdivisions into which the group falls, and of which *Eleodes* is common to both series.

It appears to us that one of the main values of the binomial is to indicate this relationship, otherwise the specific name would be enough. At any rate, it is to be regretted that so much labour is spent on the classification of the group, and then, by this strange application, we had almost said misuse, of terms, the value and efficiency of the classification is lost. If a species is to be known by two names, the generic and the specific, it is clear that Mr. Blaisdell's work loses force by his methods. He divides the group *Eleodes* as follows:

ELEODES—*MELANELEODES*—*debilis*, *carbonaria*, *ampla*, *obsoleta*, etc.

STENELEODES—*gigantea*, *longicollis*, *innocens*, etc.

HEPTEROPROMUS—*veterator*, etc.

ELEODES—*obscura*, *acuta*, *suturalis*, etc.

and so on, so that *Eleodes* gets two entirely different classificatory values in the scheme. If the name is to indicate the position of the insect in relation to its nearest congeners, it is clear that the species should be indicated by the name next in value above the species, *e.g.*, *Melaneleodes debilis*, *Eleodes obscura*, etc., but to maintain the binomial shibboleth, Mr. Blaisdell describes the species as *Eleodes debilis*, *Eleodes obscura*, *Eleodes veterator*, etc., and the main value of the classification is buried and unused.

It is, of course, much to be regretted, for the sake of authors themselves, that, so long as naturalists choose to insist on the necessity of a binomial nomenclature—and the necessity is undoubted—and so long as they choose to insist that the two names of an insect shall be the generic and specific—and this is equally undoubted—authors should go to the trouble of working out excellent generic diagnoses of the various groups found within the limits of one of the old heterogeneous lumpings called genera (the best possible groupings at the time the names were created), and then drop the new and clearly generic names created for the new (equally clearly generic) groups, and use the old generic, and what should be the new tribal, names as the generic, so that the new subdivisions, the real outcome of so much labour and study, do not even appear in the names applied to the species at all.

It appears desirable that, so long as we insist on a binomial nomenclature consisting of a generic and specific name, the name next above the specific should be the generic, and a scheme that creates and diagnoses such names and expounds in detail the relationship of the species included therein, should be put forward at its full value, and the names not created and then sunk into obscurity beneath the glory of the new tribal cognomen which is still forced to attempt to do its old duty as a generic name. By his methods, Mr. Blaisdell has done less than justice to what appears to be an intelligent and intelligible classification of the group formerly known as the genus "*Eleodes*."

The South-Eastern Naturalist for the current year has just been published. This journal, the organ of the South-Eastern Union of Scientific Societies, contains a large number of excellently illustrated scientific articles, including one relating entirely to entomology, "Leaf-miners," a first-class paper by Mr. A. Sich. The volume can be obtained from Rev. R. Ashington Bullen, "Englemoor," Heathside Road, Woking.

One of the very finest private collections of lepidoptera in Britain, that of the late Mr. J. A. Clark, is shortly to come under the hammer at Stevens' sale-rooms. Indeed, the sale of the first part is already advertised to take place on November 2nd and 3rd. The collection contains a long series of almost all our rarest and extinct British species, a very large number of unique aberrations that have been brought together regardless of expense during the last 40 years. It will be remembered that the types of the marvellous aberrations of several species—*Peronea cristana*, *Mimas tiliae*, etc.—described by Mr. Clark, have been figured in our magazine.

We purpose shortly to bring the subject of the variation of *Agriades coridon* and *A. thetis (bellargus)* under review, at one of the meetings of

the Entomological Society of London. We should be glad of any details with regard to the variation of these species that any of our readers can give us.

There can be no doubt that the *polonus* of Zeller, referred by Staudinger to *Agriades bellargus* as a variety, is really a hybrid between *Agriades coridon* and *A. thetis (bellargus)*. There is, besides Zeller's original type, another specimen from the "Leech coll." in the British Museum coll., our own example captured at Cuxton in May, 1893, etc. We believe that Lowe's *A. coridon* var. *calydonius* is also to be referred here, and other examples that have given their captors trouble. We merely note this in the hope that anyone who has specimens taken with *A. thetis (bellargus)* in the spring, but looking like *A. coridon*, yet of approximately *bellargus*-colour, will communicate with us. Of course, we are not here talking of the blue races of *A. coridon* taken in Spain and Asia Minor.

BITUARY.

Lajos Aigner-Abafi.

Born 1840, Died June 19th, 1909.

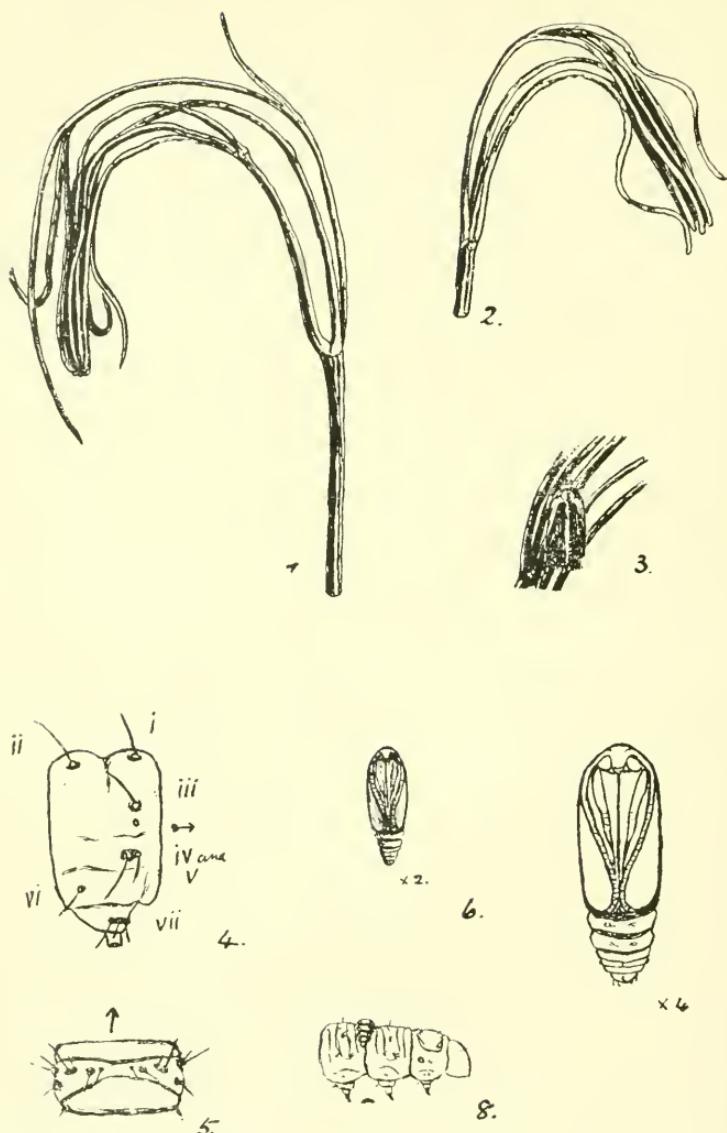
It was at Buda-Pest Museum, during the early days of June, 1907, that I first made the acquaintance of the late Herr Lajos Aigner-Abafi, one of the greatest if not the chief authority upon the macro-lepidoptera of Hungary. The trouble he took in showing me (then a perfect stranger to him) all the specimens in the collection which he thought would interest me, created a deep impression; his kindness was limitless, and all the moments he could spare from the museum were placed at my disposal, and the pleasant rambles I had with him in the neighbourhood of Buda-Pest will always remain in my memory as some of my brightest entomological excursions; but I became better acquainted with the character of this keen naturalist on the two occasions I visited Peszér, the grand collecting ground about 30 miles from Buda-Pest. His enthusiasm was unbounded, for, after having wandered through the forest for many many hours, and arriving at the inn fairly fatigued, I remember Herr Aigner exclaiming, "I must be off again," and so he went returning long after dusk with a box full of interesting lepidoptera. On the occasion of my second visit to Peszér, he accompanied me, but I had to return to Buda-Pest the same night; Herr Aigner, however, determined to remain, saying, "Here I am among a grand number of lepidoptera, and here I intend to remain." We parted, and we never met again.

He contributed, I believe, frequently to the Hungarian periodicals, and I have before me a paper written by him, "Schmetterlings-Aberrationen aus der Sammlung des Ungarischen National Museums," a most interesting publication with various illustrations of the principal varieties in the Museum.

He will be greatly missed by a large circle of friends, and especially at the Museum, whose collection he so dearly loved, more so, it seemed, than his own, rich and interesting as it was.

In his home life he was genial in the extreme, and Frau Aigner shares the same quality.

For some time after my return to England, I kept up a correspondence with Herr Aigner, but long intervals of silence augured some ailment and the end which has come at last.—A.H.J.



Del. A. Sieh

DEPRESSARIA PUTRIDELLA, SCHIFF.—DETAILS OF LARVAL HABITS, LARVAL STRUCTURE AND PUPAL STRUCTURE.

Notes on the season at Sandown, Isle of Wight.

By LOUIS B. PROUT, F.E.S.

As collecting notes from the Isle of Wight have not been unduly obtrusive in the *Entomologist's Record* lately, and as I have had the satisfaction of making several additions to Mr. Poole's very valuable list of the lepidoptera of the island (recently noticed in this magazine, *vide* p. 190, *suprà*), I think there is sufficient *raison d'être* for the following notes.

I spent nearly the whole of my summer holiday this year at Sandown, arriving there on July 17th, and leaving on September 4th. For a few days at the commencement I had the company of my friend Mr. S. J. Bell; a little later I was joined by Mr. C. Capper, and later still by Mr. W. B. Pratt, F.E.S. I had not, on the whole, any reason at all to complain of the scarcity of insects, although—excepting the one glorious fortnight at the beginning of August—the weather was decidedly mixed.

I used to visit the locality annually at just about the same date as this year, and, therefore, I have some good data on which to gauge the backwardness of the season that has just closed. For instance, among the insects which were swarming at sugar on the downs when I arrived, were a number of *Xylophasia sublustris* in good condition, one worn *Neuria reticulata*, a few good *Caradrina morphens*, *Leucania comma*, *Apamea gemina* (one very worn was observed as late as August 3rd), *Anathes primulae* (= *Noctua festiva*), first broods of *A. c-nigrum*, *Agrotis segetum*, *A. exclamationis*, etc.; all these are species which have usually been nearly, or quite "over" on my arrival, *N. reticulata* indeed (and perhaps others), having never presented me with even a straggler on any previous occasion. *X. sublustris* continued to visit the sugar up to August 7th, and was fairly numerous till August 2nd, whereas my previous total was scarcely half-a-dozen, all taken at the very beginning of my visits. Similarly by day, some unexpected species were still lingering on. I netted an absolutely fresh specimen of *Iodis lactearia* on July 19th, its beautiful green colouring such as I have never, in over 20 years' experience, matched, except in a bred specimen. *Hemithea aestivaria* (*strigata*) lasted in irreproachable condition into the beginning of August, while such occurrences as a *Leucania obsoleta* in fair condition on July 20th, first brood of *Dysstroma truncata*, though very worn, on July 24th, *Entricha quercifolia*, *in cop.*, on August 6th, *Hypocotis* (*Gnophos*) *obscurata* scarcely out till the end of August, *Scopula lutealis*, a few worn on August 26th, and probably others, which I do not call to mind at the moment, deserve mention in view of the fact that Sandown is usually a pretty "forward" locality. Perhaps it is also to the lateness of the season that I owe the addition of *Tricheris aurana* to the Isle of Wight list, a worn specimen turning up close to the town, in an often-visited spot, on July 18th; yet I may easily have overlooked this species on earlier visits. But what puzzled me most was the abundance, in good condition, of *Hipocrita jacobaeae*, from the time of my arrival until well on into August—at least until the 10th. I do not think I ever saw the imago on the wing at Sandown before, and it was suggested to me that this was possibly a case of a second brood, rather than of retarded emergences. Can any reader enlighten me as to whether the

NOVEMBER 15TH, 1909.

species ever throws a second-brood? I may add that larvae in all stages of growth were, as usual, much in evidence at the same period.

Sugaring on the downs, in spite of the abundance of common species whenever the weather was favourable, was not remunerative in "good things." A few nice *Agrotis lunigera* were obtained, and a few good forms of *A. corticea*, which latter swarmed in July; but the autumn rarities were either completely absent or retarded until after my departure, not even the erstwhile "rarity," *Caradrina ambigua*, putting in an appearance. *Aporophyla australis* was only just commencing to emerge when I left, and the coveted black form (ab. *ingenua*) did not turn up. The rarest *Depressarias* were also absent, though I was pleased to take one *D. pallorella*, after its disappearance for a good many years. In one locality *Hellinsia (Leioptilus) carphodactyla*, second-brood, was found in fair numbers on September 3rd, sitting about on grass and other plants near its foodplant after dark.

Steyne Wood, Bembridge—that "happy hunting ground" of the late Dr. Wallace—was visited once or twice when it was too windy to work the downs. Sugar, however, was there a failure, and we were limited to a little dusking and chance searching. Mr. Bell, on July 25th, turned up one or two worn *Ophiusa (Toxocampa) pastinum*, a species for which we have no recent records in the eastern part of the island, although its abundance near Freshwater is matter of common knowledge; the rest of the captures were ordinary things such as *Rivula sericealis*, *Cleorodes lichenaria*, etc.

But more attention was given to the marshes, and to St. Helens' sand-hills, both of which I felt were worthy of more work than they had formerly received; and it was here that most of the best successes were achieved. On the marshes the sugaring was not exciting, though not an *entire* failure. The visitors included *Dyschorista fissipuncta* (*upsilon*), *Mamestra dissimilis* (*suasa*), both broods, *Hama abjeta*, *Hydroecia paludis*, and others, but the last-named was much commoner at light, and some nice aberrations were obtained. There were (as usual!) not many really favourable nights for light, yet with the aid of this attraction, and a certain amount of careful searching among the reeds, a nice bag of *Senta maritima* and *Leucania straminea* was made, together with a few *Scoparia pallida*, *Chilo forficellus*, *Schoenobius gigantellus*, *Crambus selasellus* and *C. salinellus*, *Tortrix costana*, *Orthotelia sparganella*, and other sundries. Noctuids, if we except the two named and *Apamea didyma*, were decidedly scarce in the actual reed-beds, though *Leucania impura* was a pest outside; excepting two *Hama abjeta*, one *Coenobia rufa*, two or three *Tapinostola fulva*, and a few *Hydroecia nicacea* and *Amathes umbrosa*, I can recall scarcely any that we saw there. A pleasant surprise, however, was the appearance of a perfect ♂ *Nonagria sparganii*, which came straight to my light on August 12th. Naturally, we followed up this clue, and by dint of a good deal of work managed to discover five or six pupæ, besides traces of others which had been torn from the stems by some of the reed-frequenting birds. Mr. Capper also, with commendable perseverance, stationed himself with his acetylene lamp close to the breeding-ground for long periods during the few succeeding nights, and managed to attract two or three more imagines. A cocoon of *Plusia festucae* was found spun up on a rush, also on August 12th, and produced a fine imago on August 30th. Some very backward larvae of *Leucania obsoleta*,

taken on August 31st, bring to a close my list of noteworthy captures on these marshes.

Nearer to St. Helens, however, the spot was kindly shown to us where Mr. R. H. Fox had discovered *Acidalia emutaria* the previous year, and Mr. Bell and I each managed to get a short series at dusk on July 19th and 20th. One ♀ obliged with about 50 eggs, but only about 10 of the larvae have been coaxed into pupating, commencing to do so on September 27th; the majority are evidently resolved to hibernate as larvae, despite the warming to which they have been subjected.

The St. Helens' sandhills were searched in vain for *Pachygastria* (*Lasiocampa*) *trifolii*, which is known to occur there, but they yielded some good sport. The Noctuids would not come to the sugared bunches of marram, and were chiefly obtained at flowers of ragwort or bramble, or occasionally marram. *Agrotis tritici* was, of course, in great abundance and variety, *A. restigialis* became rather common by August 27th, while of *A. ripae* and *Leucania littoralis*, a very few belated specimens were observed well on into August. Larvae of *A. ripae* were in the utmost profusion; three of us collected about 700 in a very short time, working only a few of the patches of *Atriplex*, etc., and leaving the small larvae. *Selidosema plumaria* was fairly common among the gorse-bushes, and I was pleased to take both sexes—the females at rest on the bushes, or on grass close by, after dark; in the New Forest, I had taken only males, probably through working for them in the day-time. The small things are probably very interesting on the sand-hills, but I did not descend below the Pyralides. Among these I was interested to make acquaintance with the local *Melisso-blaptes bipunctanus*, which positively swarmed in one place, and *Nephopteryx genistella*, which was common among the gorse; but what pleased me most was to turn up *Crambus contaminellus* and *C. alpinellus*, the latter quite commonly in an extremely restricted spot. *C. contaminellus* is given as an Isle of Wight species in More's list (1860), but I had rashly challenged it and got it relegated to Mr. Poole's appendix, where Mr. Bankes suggested that "If More's insect occurred in the salt-marshes, it was doubtless *C. salinellus*." It appears doubtful whether More and Dr. Wallace worked the marshes much, as they were ignorant of the occurrence of several of the species I have enumerated above; but they had clearly worked the sandhills, recording *Agrotis restigialis*, *Leucania littoralis*, and *Selidosema plumaria*, unless, indeed, these records came from the other end of the Island—unfortunately, no localities were given.

Calamia phragmitidis, with the beautiful extreme form of ab. *rufescens*, *Euchlaena apicaria*, *Eupithecia coronata*, *Crambus latistrius*, and other old friends, still occurred in their old haunts between Sandown and Shanklin, but, often though I had worked that particular piece of ground in former years, I found there were still new friends to be added to my list; on August 14th, a *Pyralis glauccinalis*, two *Nephopteryx genistella*, and a ♀ *Zonosoma porata* came to my light, and on August 21st, a rather worn *Pterostoma palpina*. Brading Down produced many of its accustomed Geometrids in greater or less numbers—*Melanthis procellata*, in great profusion, *Pareuchloris chrysoprasaria* (= *vernaria*), *Euphyia picata*, *Anticlea rubidata*, etc.—but I think nothing novel in this superfamily; one Tortricid new to

the Isle of Wight list, *Peronea boscana*, was, however, taken there on July 24th.

An exploring expedition over the fine wooded downs west and south-west of Newport, resulted in my finding two welcome *Eupithecia* larvæ—*E. trisignata* and *E. denotata* (*campanulata*). The former, an addition to the island list, was found in two places on *Pastinaca sativa*; the latter occurred on its usual foodplant, in Lorden Copse, and gave definiteness to a vague record culled from Meyrick, who gives its distribution as "Kent and Isle of Wight to Hereford, local."

I subjoin, both for facility of reference, and in order to insert further detail which has not appeared in the body of this article, a list of all important additions to Mr. Poole's list, whether of newly-recorded species, confirmation of old or indefinite records, or supplementary localities for local species. Those marked * are actually new to the list.—**Nonagria sparganii*, marshes near Sandown. *Agrotis vestigialis*, St. Helens' Spit, common. *Dyschorista fissipuncta* (*Orthosia epsilon*), marshes near Brading. *Rivula sericealis*, Steyne Wood, Bembridge. *Ellopia prosapiaria*, Sandown, at light. *Selidosema plumaria* (*erictaria*), St. Helens' Spit, common. **Eupithecia pulchellata*, Bordwood, Boniface Down (known to me as an Isle of Wight species for many years, unaccountably omitted from the list). **E. trisignata*, Swainstone and Rowridge, larvæ on *Pastinaca sativa*, *E. denotata* (*campanulata*), Lorden Copse, larvæ on *Campanula trachelium*. **Pyralis glaucialis*, Sandown. **Scoparia basistrigalis*, America Woods near Shanklin; Steyne Wood near Bembridge. *S. pallida*, marshes near Sandown. *Scopula lutealis*, Chillerton Down. **Platytes* (*Crambus*) *alpinellus*, St. Helens' Spit. *Crambus contaminellus*, St. Helens' Spit. *Ephestia elutella*, St. Helens' Spit. *Nephopteryx genistella*, Sandown; St. Helens' Spit. **Rhodophaea formosa*, near Brading, one at light. *R. suarella*, St. Helens' Spit. **Peronea boscana*, Brading Down. **Paedisca solandriana*, Lynnbottom Copse, near Haven Street. **Carpocapsa splendana*, Sandown and district (accidentally omitted in Poole's list). **Tricheris aurana*, Sandown. *Nannodia stipella* var. *naeriferella*, Sandown. **Ceratophora rufescens*, Sandown.

A Lepidopterist's Summer in Central Italy.

By GEORGE WHEELER, M.A., F.E.S.

It will be readily understood that the only entomologist in a party of six, especially if it falls to his lot on most occasions to act as courier for the rest, cannot give to his subject the amount of attention which it requires at all times, and more particularly in a district so little worked as central Italy; but the length of our stay in Assisi, extending over more than six weeks, made it possible to devote the hours between luncheon and tea on most days to collecting, and, by always having a net ready, walking up hills on all driving excursions, and snatching an hour or so whenever it was possible, especially "while others slept" in the heat of the day, a certain amount of information was to be obtained, and a certain number of specimens were procurable. My previous experience of collecting in Italy was confined to certain raids over the northern border in the neighbourhood of the Italian lakes, a few September afternoons in the old quarries of Fiesole, and under the walls of Assisi, a couple of hours in the Val d'Ema, outside

Florence, and about the same length of time on two other afternoons, one just below Perugia, and the other, in mid-October, in the gardens of the Villa d'Este at Tivoli. It was, in various ways, an immense gain to stay so long this year in one place, as it enabled one to note exactly the coming and going of different species, to make absolutely sure in certain cases of a double-brooded habit, where it was uncertain or perhaps unsuspected, and to get at least a good general idea of the butterfly fauna of one practically unworked locality during the busiest part of the summer.

We left London on June 14th, and, spending two nights at Milan on the way, arrived at our old quarters at the Porta Rossa at Florence, on the 17th. As our stay here was to be but short, I made my way up to my old hunting-ground at Fiesole the following afternoon. Here I found *Polyommatus escheri* and *Agriades coridon* fairly common (for Italy), the former being very fresh, *A. thetis (bellargus)* just emerging, as were also *Brenthis hecate*, *Rumicia phlaeas*, and *Melanargia galatea* var. *procida*: there were also a few *Scolitantides baton*, and a fair supply of *Coenonympha pamphilus*, the latter somewhat worn, and one disreputable *Pyrameis cardui* persistently sat upon the road in front of me. The following afternoon I got half-an-hour or so in the Val d'Ema; here *Polygona egea* was common and in fair condition, *Pieris rapae* was fresh, as were also *Epinephele jurtina* and *Pararge megaera*: two or three torn *Pieris napi* of the *napaea* form, and a couple of torn *Nordmannia ilicis* were the only other species seen. On the afternoon of Monday the 21st, I got in a second visit to Fiesole; here *P. escheri* was no longer common, though still fresh, and I took two ♀s, one of which has almost the whole of the lower wings, except the costa, suffused with brilliant blue, and small patches of the same colour just inside the orange border of the forewings. All the specimens are slightly lighter and brighter, and much smaller than those of the Rhone Valley and the neighbourhood of Bérisal. *Agriades coridon*, a darkish form, was still common, but *A. thetis* was in small numbers only, the ♀s, however, being specially fine, not of the *ceronus* form, but with very broad and bright orange borders. *Brenthis hecate* was commoner than on the 18th, but there were as yet no ♀s to be seen. It is not an easy species to take, as it flies in and out amongst the heather and other low-growing plants, and may thus be readily distinguished on the wing from *B. euphrosyne*, which generally remains above the undergrowth, though the two species look much alike, the flight of *B. hecate* being however somewhat slower, as is indeed necessitated by the habit just referred to. *Powellia sao* was fairly common, and *Thymelicus acteon* and *Adopaea lineola* in considerable numbers. All these species except *A. coridon* were confined to the north-east side of the hill, while *S. baton* was to be found only on the south and south-east, where I also took one *Pontia daplidice*, and saw a few *Celastrina argiolus*. *Colias edusa* and *Epinephele jurtina* were to be seen in all three places.

On Wednesday the 23rd, we left for Assisi, where on the following morning *Polygona egea* was seen to be abundant. In the afternoon I went down into the plain below the town, and hunted round a field of purple vetch, where *Plebeius argus (aegon)* was common but almost over; *Melanargia galatea* (somewhat lighter than at Fiesole), *Leptosia sinapis* (second-brood form) and *Adopaea lineola* were all abundant,

Epinephele jurtina and *Colias edusa* fairly common; there were also a few *Polyommatus icarus* and *Pieris rapae*, and one specimen each of *Melitaea didyma*, *Raywardia telicanus*, *Issoria lathonia*, and *Aricia astrarche* of the extreme *calida* form. In the same place on the following day the same species were again to be seen, but there were several specimens of *I. telicanus*, and, in addition, one *Eugonia polychloros*, very fresh, and some large fresh males of *Celastrina argiolus*. The specimens of *P. aegon* (I call it so to avoid confusion) are mostly of largish size, especially the ♀s, the ♂s being of a deep purple-blue, the border not very broad, and scarcely suffused, but with the nervures showing black at least half across the wings, and a row of black spots perceptible on the hindwing; the underside dull grey, with the white band clearly visible on the hindwing, the orange band broad on the hindwing, and visible the whole length of the forewing, the metallic spots very distinctly marked; the ♀s have the orange border very distinct on all four wings above and below, a distinct row of black spots showing between this and the border; on the underside the white band is generally somewhat less continuous on the hindwing than in the ♂, but is more clearly indicated in the form of dog-toothing on the forewing.

The next day I went some short distance along the road east of the town, towards the "Carceri." Here *Satyrus cordula* was just coming out, ♂s only as yet, a few fine ♀s of *Celastrina argiolus* with very broad black border were to be seen, a few worn *Nordmannia ilicis*, the ♂s, and sometimes even the ♀s, without a touch of orange on the forewing, *Rumicia phlaeas*, *Polygonia egea*, and *Thymelicus lineola* were also in evidence, and, as if to mark the lateness of the season, one *Callophrys rubi* and one *Euchloë cardamines* still in good condition. The two best localities, however, proved to be the cemetery road above the church of San Francesco, and the north road outside the Porta Pernici, down to the Piano della Pieve. It would be tedious to go through the various captures of each day, which were often repetitions of previous ones, and it will be more to the point to mention only those of special interest, giving at the end of the paper a complete list of the species observed, with their localities and dates. The 28th produced on the cemetery road, amongst other species, *Agriades thetis* (*bellargus*) in abundance, both sexes being very large, and in first-rate condition, one ♀ *Lycaena iolas*, very worn, which I kept in hopes of eggs, but which was unfortunately let out by prying hands the same day, a few worn *Melitaea parthenie*, evidently stragglers from the first brood, and a "blue" which I took to be *A. coridon* ab. *calydonius*, about which there is a good deal to be said. In this particular place I took three specimens of this form on June 28th, July 1st and 2nd, respectively. At this time *A. thetis* was fresh and abundant, but there was no sign of *A. coridon*, which did not appear till July 22nd. On the 19th I took another worn specimen on the north road, and on the 24th another, perfectly fresh, among *A. coridon*, *A. thetis* being, at this time, quite a thing of the past. Now in spite of all that has been written to the contrary, my own theory still is that these specimens are probably hybrids. The fact that they are found among both species at the time of their respective emergence, seems to point in this direction, and the two species are admittedly extremely close together, especially in the early stages. The strongest argument against this theory, *viz.*,

that one species is persistently single-, and the other double-brooded, breaks down entirely in a locality where both are at any rate double- and probably triple-brooded. Furthermore, in a late spring like that of the present year, it is at least probable that the first brood of the two species would be nearly, if not quite, contemporary, and in all years they must to some extent overlap. The only other theory which would account for the facts, would seem to be that in both species there is a tendency to throw back to a common ancestor, which must have been half-way between the two. It would be an interesting experiment to see whether the first broods of these species would hybridize in captivity, and, if this be the case, whether the resulting imagines are of this form. It may be worth while to add, that *A. coridon* at Assisi is, in this brood at any rate, of a somewhat brighter tint than is usual in this species.

The 28th was also marked by the first appearance of *Colias hyale*. As this species became more common, *C. edusa* became less so, and when, towards the end of July, the latter became common again, the former had almost disappeared, and from the time of my leaving Assisi on August 6th, I saw it no more till August 20th, when a fresh brood appeared.

The 29th was a dull day, but as we were driving to Spello in the afternoon, I started before the carriage and walked some four miles before it overtook me. In spite of the dulness I took the following species: *Adopaea lineola*, *Erynnis alceae*, *Pieris manni* var. *rossii* (or rather a transitional form), *P. napi*, *Colias edusa*, *Pararge megaera*, *Epinephele jurtina*, *Raywardia telicanus*, and *Scolitantides baton*, the latter of which was certainly the commonest "blue" throughout my stay in Italy, and appeared to be continuously-brooded, both fresh and wasted specimens being always to the fore. It was only after my return to England that I gathered from Dr. Reverdin's paper in this magazine that *rossii* is regarded as a variety (or summer form) of *P. manni*, and not of *P. rapae*, as I have not seen Turati's paper, but I had independently come to the same conclusion, *P. var. rossii* and perfectly typical and considerably larger *P. rapae* being quite contemporary in central Italy.

On July 2nd I took the first specimen of *Plebeius argyrogynomon*, a ♀, on the cemetery road near Assisi. This species afterwards became common, and was to be taken in any numbers at the Piano della Pieve, and in the nearly dry bed of the Tescio from July 19th onwards, a few coming up as far as the cemetery road, but none being seen in the vetch-fields to the south of the town. The specimens vary much in size, but do not average larger than *P. aegon*: the black border of the ♂ is very clearly defined and narrow, succeeded on the hind-wing by small black dots, but the nervures show black at their extremities, and are generally perceptibly dark throughout; the undersides have less white and less orange than *P. aegon*, but larger metallic spots; the ♀s vary not only in size, but also in the amount of orange and blue on the upperside, some being almost entirely without one or the other of these colours, and the amount of the one being almost always in inverse proportion to the extent of the other; on the underside they have the ground colour of a clear fawn colour, the white and orange bands being scarcely less conspicuous than in the ♀s of *P. aegon*. On the 2nd I also took a torn specimen of *Limenitis*

camilla: this belonged to the first brood, and was large, with more white than is usual further north; later on, from early August onwards, a second brood appeared; these were small specimens, and no whiter than one sees in Switzerland; it was however scarce. The same day witnessed the capture of the first pair of *Hipparchia semele*. On the 3rd we drove by Spello and Foligno to Montefalco; just beyond Spello I saw several specimens of *Iphiclides podalirius*, and near Montefalco I took *Colias edusa*, *C. hyale*, *Pontia daplidice*, *Polygona eyea*, *Polyommatus icarus*, and *Thymelicus acteon*. The 5th was noticeable for the capture of *Coenonympha dorus* on the north road; this species became common in this locality from the 10th till nearly the end of the month, but I did not see a single specimen elsewhere. *Polyommatus meleager* appeared on the 8th, and afterwards was one of the commonest "blues" till I left Assisi early in August, but, during the whole time, I saw but one ♀; this was small, but of the blue form. In Switzerland, in its few localities, I have found the ♀ at least as commonly as the ♂, so that I am quite at a loss to account for its extreme rarity of appearance here, since it can hardly be put down to ignorance of its habits, to which I should otherwise have ascribed it, nor to difficulty in seeing it, since the blue form is almost as conspicuous as the ♂. In Switzerland it is true that it appears in public a good deal later than the ♂, but here I had nearly a month in which to find it after the ♂'s first appeared. On the 9th I walked to the "Careeri," which is nearly 1000ft. higher than the town, where *Hesperi carthami*, smaller than those of the Rhone Valley, was sitting in numbers at one point in the road. On the way back I saw a few *Dryas paphia*, and took amongst other things a ♀ *Aporia crataegi* and a magnificent ♀ *Bithys quercis*, the only specimen of either species that I saw in Italy. On the 10th I took on the north road the only specimen of *Libythea celtis* that I came across at all, and on the same day the first of the very few *Cupido minimus*, some four specimens in all, that it fell to my lot to see during my visit. *Papilio machaon* was in some numbers on this day outside the Porta San Francesco, on the way down to the Perugia road. The only points worthy of note during the following week, are the appearance of a fresh brood of *Nisoniades tages* on the 13th, when a fresh brood of *Coenonympha pamphilus* also began, and the first appearance of *Euippele ida* on the following day; all these three species were subsequently fairly common. Also on the 17th at the Piano della Pieve, I took a remarkable aberration of *Melanargia galatea*, in which the whole of the left side, except two largish and four tiny subcostal spots, is completely black; there is also a good deal of black suffusion on the right forewing; below, the left forewing is almost entirely black, and there is much black suffusion on the other three wings, the rings of the eye-spots on the hindwings being of a deep dead-gold colour. On the 19th the second-brood of *Melitaea parthenie* appeared down at the Piano della Pieve, and by the 22nd had come out also on the north road. There is little or no difference between the two broods; both are rather heavily marked on the upperside (for *parthenie*), and the underside hindwing, especially in the ♀, is rather light; the ground colour of the upperside is of a slightly yellower tawny than is usual in Switzerland, but they are very much nearer to the Swiss than to the Spanish form. On the 19th and 22nd I took the only

two specimens of *Polyommatus hylas* that I saw, and on the 23rd my sole *Cupido sebrus*; all came from the north road, and all might equally well have come from the Rhone Valley, though they were a little smaller than the average of the latter locality; all were ♂s. On the 22nd I also saw in a garden in the town the only *Gonepteryx cleopatra* that put in an appearance during my long stay. On the 23rd I found to my great surprise, in one of my boxes on my return from the north road, a specimen of *Hirsutina dolns*, which I had boxed under the impression that it was a light *Agriades coridon*, without paying any special attention to it. This naturally set me off in search of more; it proved however to be scarce, and I only took six more during my stay, viz., one on July 26th, two on August 2nd, and three, including a ♀, on August 3rd; possibly it may have become commoner later, but August 4th and 5th were streaming wet days, and on August 6th we left. All these specimens came from the north road, and all within a mile or less of the Porta Pernici; I saw none elsewhere. It was on July 22nd that I took my only ♀ *Polyommatus meleager*, and my only *Polygonia c-album*, also my first specimens of *Agriades coridon* at Assisi, as well as the earliest *Hipparchia briseis* these two species soon became common, as did *Satyrus hermione* on the cemetery road and elsewhere.

(To be concluded).

Depressaria putridella, Schiff.—A species new to Britain (with two plates).

(Continued from p. 223.)

By ALFRED SICH, F.E.S.

VARIATION.—This species is evidently subject to a large amount of variation, especially in the ground colour, and in the amount of development of the dark markings on the forewings. Besides the type, there are three other forms quite distinct in their fullest development, but all connected with the type by intermediate forms.

a. Ground colour pale ochreous-brown, the cell and veins strongly marked in fuscous = *putridella*, Schiff.

b. Forewings and fringes almost unicolorous dark brown, the veins indicated in fuscous, but not conspicuously (Stt., *Nat. Hist.*, vol. xii., pl. vi., fig. 3m). Germany, Stt. coll., Brit. Mus. = ab. *brunnea*, n. ab.

c. Forewings, except base and basal portion of the costa, entirely suffused with blackish-brown. On the costa towards the apex, are a few pale dashes. The stigmata and the dark veins almost obliterated by the dark suffusion = var. *peucedanella*, Mill.

The specimen above described is a ♀ in British Museum coll., and labelled “*peucedanella*, Mill., n. sp., Golfe Juan. Constant. 8.82.” There is also a very dark ♂ without pale costal dashes, from the same source. There are also specimens from Staudinger from the south of France, but, though they belong to this form, they are not so dark, and the usual markings are quite visible. This appears to be the usual southern form, and is distinctly different from the type. Through the kindness of Dr. Chapman I have at last been able to see Millière's figures and descriptions of this species given in the *Annales de la Société des sciences naturelles*, &c., de Cannes for 1880. This volume I was quite unable to consult at any of the London libraries. The following is Millière's description of var. *peucedanella*: “Enver-

gure : 15-à-17mm. Ailes supérieures d'un brun-noirâtre, avec la côte ocracée par places. La base est très visiblement limitée extérieurement par une grande tache noire qui se fond ensuite dans la couleur générale. La tache ocracée se dirige vers la côte, s'étendant en point jusqu'au milieu de l'aile. A la base sur la côte, existe un point noir; au tiers de l'aile sont placés obliquement deux autres points noirs et en ligne avec le second plus éloigné de la base, il y a quelquefois des traces d'un petit point blanc cerclé de noir. Aux deux tiers de l'aile, on voit à peine la trace d'une ligne foncée partant de la côte et formant un angle très aigu avant d'arriver au bord interne. Le bord externe est clair et entrecoupé de points noirs. La frange, en dessus et en dessous, est d'un gris obseur. Les ailes inférieures sont luisantes, d'un gris fuligineux plus clair vers la base, avec la frange d'un gris noirâtre." Then follows the description of the body and limbs, which it seems unnecessary to quote. Besides the specimen, already mentioned, from Golfe Juan, there is another very typical specimen in the British Museum coll., bearing the number, "698," and labelled "S. France, Staudinger, 7.1.90."

d. Forewings uniform pale brownish-ochreous, the inner margin at the base, the last third of the costa and the hind margin dark grey. Hind marginal spots black. The stigmata are normal, and there are a few minute dark scales on the disc of the wing, which is otherwise entirely of the pale ground colour = ab. *esterella*, Mill.

One specimen in British Museum coll. labelled "South France. Staudinger, 7/1/90." There is also a specimen somewhat approaching this form from Constant, labelled "Golfe Juan, 8.82." This is evidently the variety which Nolcken mentions (*Ent. Zeit. Stettin*, 1882, p. 190). He says that Millière wrote (1880) that he was about to describe his *peucedanella*, and an aberration in which the forewings, thorax, and abdomen, were "leather-yellow," instead of brown. The description, given by Millière of ab. *esterella*, runs as follows with regard to the wings: "Ailes supérieures de couleur plus ou moins ocracée, saupoudrées d'écaillles noires et légèrement ombrées de brunâtre au dessous de la côte. L'espace basilaire de la couleur du fond est limité par quelques écaillles noires. Un point à la base sur la côte, deux autres obliquement au tiers de l'aile, et un point blanc cerclé de noir sur le disque. La frange concolore est précédée d'une série de très petits points noirs. Les ailes inférieures sont d'un gris chaud, avec la frange d'un gris obseur." Millière states that this aberration is nearly as abundant as the form described as *peucedanella*.

ALLIED SPECIES.—*D. putridella* is a very distinct species, unlike any other European species that I have seen. Its rounded forewings, with the veins darkly marked, and the conspicuous white discoidal spot, together with the dark grey hindwings, mark it off from the other species. It may, however, be useful to compare this species with *D. umbellana*, which has the veins darkly marked, and also with *D. yeatiana*, which sometimes has the veins dark, and has also the white discoidal spot.

COMPARISON OF *D. PUTRIDELLA*, SCHIFF., WITH *D. UMBELLANA*, STPHS.—*D. umbellana* is a much larger insect, with narrower forewings on which the markings are worked out in streaks, while in the neater *D. putridella*, the pattern is carried out in lines and clouds. The former insect measures from 20mm.-22mm. in expanse, whilst the latter seldom exceeds 17mm. In *D. umbellana* the first discal spot of the forewings is conspicuous, and the second discal small, both black.

These two spots lie in a streak of the pale ochreous ground colour. In *D. putridella* these spots usually lie in a dark cloud, and the second discal spot is large and conspicuous, with a white centre, while between these two spots there is nearly always a black dash. *D. umbellana* has a very dark line on the extreme inner margin of the forewings. This line is absent in *D. putridella*. The hindwings of the former are paler, and the fringes, especially round the apex, are ochreous. The latter has grey fringes on the hindwings.

COMPARISON OF DEPRESSARIA PUTRIDELLA, SCHIFF., WITH *D. YEATIANA*, FAB.—Of all the British Depressariids, *D. yeatiana*, though much larger and of a different ground colour, comes nearest in its markings to the lighter forms of *D. putridella*. This is more noticeable in those specimens of the former which have the veins very strongly marked on the forewings. *D. yeatiana* expands from 18mm.-20mm., and the ground colour is pale greyish-ochreous, with a slight admixture of rose-colour which gives the wing a warm tint, quite different from the ochreous-brown of *D. putridella*. Whatever the depth of colour on the forewings of the former, it is always spread evenly over the whole wing, while, in the lighter examples of the latter, there is a dark central cloud running from the base towards the apex. The twin black spots, not far from the base, are present in both species, as is also the second discal spot, which is white, with a more or less complete black border. Obliquely above the white spot in the former, lies a large round cloudy spot, which is naturally better defined in the darker-marked examples. This cloudy spot is wanting in the latter, which, on the other hand, has a small black spot between, and in a line with, the white spot and the lower of the twin spots. The effect is that the four spots in *D. yeatiana* appear as two pairs placed obliquely across the wing, one after the other, while in *D. putridella* three spots run in a line, while a fourth at the commencement lies slightly above the line. These two species are also easily separated by the colour of the hindwings and fringes. In *D. yeatiana* the hindwings are pale grey, with a more or less ochreous tinge, and the fringes of the hindwings are much paler grey, with a yellow-ochreous, or sometimes brownish-ochreous, tint. The hindwings of *D. putridella* are quite dark grey, and the fringes dark grey or dark brownish-grey. Occasionally in the ♀s, the fringes have an ochreous-brown tint, which, however, is different from that sometimes occurring in the other species.

COMPARISON OF *D. PUTRIDELLA*, SCHIFF., WITH OTHER ALLIED SPECIES.—Among the Palæarctic species, *Depressaria mongolicella*, Chr., comes very close indeed to *D. putridella*. It is a Siberian species from the Amur, and Christoph, its describer, says (*Bull. Soc. Imp. de Nat. de Moscou*, 1882, p. 15): “It differs from *D. putridella* in its uniform reddish-grey colour, in the veins being darkly marked only on the outer portion of the forewing, and the marks on those on the costa, running into the fringe which is pale reddish-grey, in the hindwings being shining pale yellowish-grey, and the antennæ reddish-brown.” Snellen also describes this species under the name of *D. septicella* (*Tijdschrift*, 1884, p. 162, pl. viii., fig. 8). He says: “This small *Depressaria* is evidently a relation of *putridella*, though the colour is different, etc. Finally, the very sharp black streaks on the veins of the last third of the wing and the light fringes, make *septicella* very recognisable.” The figure accompanying Snellen’s paper illustrates

well his remarks. The larva and foodplant appear to be unknown. Another species *D. ramosella*, Stt., from the Caucasus, has a strong resemblance to *D. putridella*. It is, however, a much larger species. Stainton, in describing it (*Tin. Syria*, p. 53, 1867) says: "It expands 10 lines (21mm.), and reminds one exceedingly of *D. putridella*. Anterior wings greyish-ochreous, with most of the nervures indicated by fuscous streaks; a darker fuscous streak runs along the median nervure; in it is a black spot before the middle, and above it is another small black spot (corresponding with the white spot of *putridella*); the veining in the apical portion of the wing is not nearly so distinct as in that species, nor have we the distinct binder marginal black spots. Cilia spotted with dark fuscous at the base, then pale greyish-ochreous. Posterior wings grey, darker towards apex, with pale grey cilia." From this condensed description it will be noted that *D. ramosella* differs from *D. putridella* in the discoidal spot, the apical portion of the wing, and in the fringes. Stainton had before him only one specimen, a ♂, which he had from Lederer. In the *Ann. Soc. Ent. Belye*, vol. xiii., p. 43, pl. ii., fig. 14, 1869-1870, Lederer gives a figure of this species, and a reference to Stainton's description. In the figure we see a dark grey suffusion over the cell, which spreads out over the apex and hind margin; the veins lying in this suffusion are marked with black. The whole figure reminds one, however, more of *D. umbellana*, perhaps, than of *D. putridella*, as the markings are more streaks than lines. In describing *D. ramosella*, Stainton uses the word *streak*, but *line* is used when he makes his description of *D. putridella*. Staudinger (*Hor. Soc. Ent. Ross.*, xv., p. 298) mentions only that he took a worn specimen of a *Depressaria* which, on comparing it with a specimen in Lederer's collection, he considered might belong to this species.

Millière compares his *D. peucedanella* with other *Depressarii*ds, two of which, it may be well to mention here, *viz.*, *D. hippomarathri*, Nickerl, and *D. cachritis*, Stgr. The former is a small species, and in its darker form bears some resemblance to the southern form of *D. putridella* ab. *esterella*, but it is of a browner ground colour, and wants the dark spots and pale dashes along the hind margin. The hind marginal dots in *D. hippomarathri*, which is a much plainer insect, are small and not very different from those which are scattered over the wing. *D. cachritis** is larger, and in its more usual reddish form, is quite different from any form of *D. putridella*, but there is a dark grey form which has a certain rather remote resemblance to var. *peucedanella*, but the ground colour is more variegated, greyer, and it has a few dark, rather elongate spots, on the hind margin, instead of the dark spots and light dashes usually conspicuous in var. *peucedanella*.

HABITS OF IMAGO.—*D. putridella* appears, so far as is known, to be similar in habits to the rest of the genus. Most of the specimens in collections appear to have been bred. In the breeding-cage, they are fond of hiding under the old leaves on the bottom, and they run rapidly when disturbed, and easily take to wing. One I noticed tried to get away by sliding on its back. The authors of the *Vienna Catalogue* probably took the moth in the open, as they say, "Larva unknown." Mann took a specimen off a garden wall near Vienna.

* *D. epicachritis*, Ragonot, is still redder in colour.

DESCRIPTION OF PLATE XVI.

Fig. 1 & 2. Tubular dwellings of the larvae of *Depressaria putridella* spun in the leaves of *Peucedanum officinale*.
 ,, 3. Imago of the same at rest.
 ,, 4. Outline of the 6th abdominal segment of larva, showing tubercles.
 ,, 5. Outline of dorsum of metathorax.
 ,, 6. Pupa $\times 2$.
 ,, 7. Pupa $\times 4$.
 ,, 8. Outline of thorax of larva showing ichneumon larva *in situ*.
 Figs. 1 & 2 natural size, the remainder more or less enlarged.

(To be concluded.)

Myrmecophilous Notes for 1909.

By H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

FORMICA RUFA-PRATENSIS, Forel.—The majority of the woodants' nests at Nethy Bridge, in Inverness-shire, belong to this race. The colouring is darker than that of *rufa*, L., but they have not the hairiness of *pratensis*, De G. (*congerens*, Nyl.). Last May I investigated a large number of these nests, which differ also from those of *rufa* in being more compact, the dome-shaped surface being smoother and flatter. The nest material not being so loose, it is capable of being removed in layers. A point which struck me very much was the way in which many of the nests were being extinguished by the under-growth. Moss starts to grow round the base of the nests, then "bilberry" and heather, which creep upwards all round the hillock, gradually driving the ants to the summit, and eventually extinguishing the colony. Most of the hillocks in the valley covered with dense undergrowth have once been ants' nests. Professor Wheeler, in a paper (*Bull. Amer. Mus. Nat. Hist.*, xxii., pp. 403-418) "On Relations of Ants to Plants," records similar cases in America and Europe, and is of opinion that the colony eventually dies off. The nests were very backward, hardly any having any larvæ, and some not even eggs, though there were plenty of ♀s. Many very small workers (micrergates) were noticed, and pseudogynes occurred in most of the nests, being very abundant in some. This must mean the presence of *Atemeles pubicollis*, though I was unable to find any, possibly on account of the backward state of the nests. The weather was very cold, and it snowed all the first day I was there, May 14th! The following species of coleoptera were found in those nests:—*Quedius brevis*, *Oxypoda haemorrhoa*, *Thiasophila angulata*, *Notothecta flavipes*, *N. anceps*, *Homalota parallela*, and *Leptacinus formicetorum*.

FORMICA SANGUINEA, Ltr.—In July I went to Bewdley to study the nests of this species. I found it present in great numbers, more so than last year, having spread all over the district. On July 20th I was fortunate enough to witness a "slave-raid," which I have described and which will be published in an early number of the *Zoologist*. I captured two gynandromorphs on the 20th and 21st, one half ♂ half ♀, and the other half ♂ half ♀, a technical description of which, with a plate, will also be found in the same number of the *Zoologist*. Some very small, winged males (micraners) were found in some of the nests.

FORMICA EXSECTA, Nyl.—In 1907, Mr. E. A. Butler swept a single ♀ of this ant in Parkhurst Forest, Isle of Wight. This was a new locality for it, so, in the spring of 1908, I went down to try and find it

at home, Mr. Butler having told me whereabouts he thought he had swept it. I was unsuccessful, so this year I visited Parkhurst again, on April 26th, in company with Mr. Taylor, of Sandown. Mr. Butler's spot not producing any, we went further, and I found a small deserted nest, which I knew to be that of *F. exsecta*. We then went on and came to a place which I surmised was most suitable for the ant, and immediately afterwards we found four nests. I took a ♀ and a number of ♂s from one, and I have them still, in a combined Field and Janet nest. A large nest near, which, from its construction and materials, was thought to be that of *F. exsecta*, turned out, on investigation, to be inhabited by *F. rufa*. Here either the former had deserted and the latter had occupied the old nest, or else the latter had forcibly taken possession. On May 17th, when at Aviemore, in Scotland, I discovered two nests of this same ant, which has never been found in Scotland, or the north, before. The present known distribution of this ant in Britain is Aviemore, Bewdley in Worcestershire, New Forest, Parkstone, Bournemouth, as far west as Poole, and as far east as Ringwood, Parkhurst Forest, Isle of Wight, Bovey Tracey in Devonshire, and the Land's End in Cornwall.

FORMICA FUSCA VAR. *RUBESCENS*, Forel.—I discovered a nest of this var. (which I took at the time to be *F. rufibarbis*, F.) last year at Bewdley, in May. I took a number of ♀s, but no ♀ could be found. This year I visited the same nest in July. There were many ♂s present, but no ♀s could be found. This looks as if the ♂s must have been the offspring of ♀s parthenogenetic eggs. The nest is situated partly under a large, heavy stone, and partly in the bank which is built up round it. This is the first time this variety has been recorded in Britain, though Prof. Forel tells me it is common in Switzerland.

TAPINOMA ERRATICUM, Ltr.—On May 9th I discovered a fine nest of this little ant at Woking, but no ♀ could be found. As there were a number of larvæ, and large and small pupæ present, I took a number of them and some ♀s to try and breed the sexes. I kept them in a small plaster nest. Some of the larvæ changed to pupæ, but, in spite of all the food I gave the ♀s—caterpillars and pupæ of other ants—they devoured all their own larvæ and pupæ by degrees. Then some eggs were laid by one of the ♀s. These were carried about for some time, but eventually eaten, so the experiment failed.

MYRMECINA LATREILLEI, Curt.—♀s of this rare little ant were taken, one in a nest of *Formica fusca*, at Rame Head, in April, one with *Lasius flavus*, Meavy Valley, also in April, and five specimens at roots of herbage, with *Lasius niger* at St. Helen's, Isle of Wight, in August. I swept up three winged ♀s and two ♂s at Ditchling, in Sussex, in August, and a winged ♀ at Tring in October. Both ♀s and ♀s of this ant feign death when handled.

MYRMICA SCABRINODIS, Nyl.—Lateral gynandromorph. My friend, Mr. Hereward Dollman, swept up a specimen half ♂ half ♀, at Ditchling, which he kindly gave to me. Only two other gynandromorphic ants, besides the two of *F. sanguinea* I mention above, have been recorded before in Britain.

STENAMMA WESTWOODI, West.—I took a ♀ in a nest of *Formica rufa* at Parkhurst Forest in April, and another with *Lasius fuliginosus* at Darenth Wood in June.

SOLENOPSIS FUGAX, Ltr.—It was found in some numbers with

Lasius niger in the cliffs at Sandown. Specimens introduced into a small plaster nest containing *L. flavus* were all killed by the *flavus* ♀s.

(To be continued).

Chætocnema arida, Foud., a species of Coleoptera new to Britain.

By HORACE ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

C. arida, Foudras, "Altisides," p. 122 (1859-60).—Ovata, cupreo-ænea, labro nigro, obtuso; antennarum articulis sex primis ferrugineis; thorace angustiori tenuissimè punctulato; elytris extrinsecus striato-punctatis, punctis dorsalibus duplicatis vel confusis. ♀ ♂ alis incompletis. ♂ Aedœagus arcuatus latè profundèque canaliculatus; apice acutè lanceolatus, leviter trunculatus. Long. 1.75mm.—Larg. 1mm.

This species comes next to *C. hortensis*, Geof. (*aridella*, Pk.), from which it may be known by its narrow thorax, which is much more finely punctured, the granulation on the vertex being hardly distinct. My specimens are smaller and narrower than *C. hortensis*, and have the shoulders more sloping. I sent a specimen to my friend, Capt. Sainte Claire Deville, as they did not agree with any of our species, and he writes, "It is certainly *arida*, Foud., a neglected species, but widely distributed in France." I swept several specimens in the Whitefield Woods, near Ryde, Isle of Wight, on August 26th, 1909. It must not be confused with *C. aridula*, Gyll., or *C. aridella*, Pk. (*hortensis*). In the *Ent. Record*, 1904, p. 83, Newbery writes of *Chaetocnema confusa*, another of our species: "It seems doubtful if the *confusa*, Boh., of our collections, is identical with Bedel's species, which is described as 'blackish-bronze.'" This, however, exactly describes our species! which I have recently taken in some numbers in Wicken Fen, and Dr. Joy takes it at Wellington College.

Recently described forms of Palæarctic Lepidoptera.

By MAX GILLMER.

Owing to the rapidity with which new forms of European Lepidoptera are being described, and in some cases redescribed, in the continental literature, I have been asked by Mr. Tutt to provide a list of those that have recently come under notice, together with references to the descriptions. As a first instalment I, therefore, forward the enclosed:—

From *Berge's Schmetterlingsbuch*, new edition, edited by Dr. H. Rebel, pt. 1 (February, 1909), pt. 2 (March, 1909), pts. 3-5 (June, 1909), p. 20, *Pyrameis cardui*, L., ab. *ocellata*, Rbl., n. ab.; p. 31, *Brenthis pales*, Schiff., ab. *pseudothalia*, Rbl., n. ab.; p. 33, *Argynnis aglaja*, L., ab. *albomaculata*, Rbl., n. ab.; p. 34, *Argynnis niobe*, L., ab. *extincta*, Rbl., n. ab.; p. 37, *Melanargia galatea*, L., ab. *aperta*, Rbl., n. ab.; p. 40, *Erebia ceto*, Hb., ab. *albomaculata*, Rbl., n. ab.; p. 43, *Erebia aethiops*, Esp., ab. *caeca*, Rbl., n. ab.; p. 45, *Oeneis aëlo*, Hb., ab. (♂) *unicolor*, Rbl., n. ab.; p. 46, *Satyrus hermione*, L., ab. *australis*, Rbl., n. ab.; p. 51, *Pararge achine*, Sc., ab. *althaea*, Rbl., n. ab.; p. 52, *Epinephele jurtina*, L., ab. (♀) *bioculata*, Rbl., n. ab.; ab. (♀) *caeca*, Rbl., n. ab.; p. 54, *Coenonympha iphis*, Schiff., var. (ab.) *exommatica*, Rbl., n. var.; *Coenonympha arcania*, L., ab. (♀) *schimae*, Rbl., n. ab.;

var. *epiphilea*, Rbl. (n. nom.) (= *philea*, Frr. cf. *Ann. Naturhist. Hofm.*, xix., p. 174. not. 1); var. *orientalis*, Rbl. (n. var.) (cf. *Ann. Naturhist. Hofm.*, xix., p. 174, t. v., fig. 9); p. 58, *Klugia spini*, Schiff., ab. *deleta*, Rbl. n. ab.; *Nordmannia ilicis*, Esp., ab. *latifasciata*, Rbl., n. ab.; p. 61, *Heodes cirgaurea*, L., ab. (♂) *pallida*, Rbl., n. ab.; p. 62, *Lowea alciphron*, Rott., ab. (♂) *caeruleascens*, Rbl., n. ab.; p. 63, *Lowea dorilis*, Hufn., gen. *vernalis*, Rbl., n. nom.; p. 69, *Polyommatus eros*, Ochs., ab. (♀) *senilis*, Rbl., n. ab.; p. 70, *Polyommatus icarus*, Rott., ab. *bion* (Koll. i.l.), n. ab.; *Polyommatus amandus*, Schn., ab. (♀) *caerulea*, Rbl., n. ab.; p. 71, *Polyommatus meleager*, Esp., ab. *obsoleta*, Rbl., n. ab.; p. 73, *Cupido sebrus*, B., ab. (♀) *caeruleascens*, Rbl., n. ab.; p. 74, *Glaucoopsyche melanops*, B., ab. *unipuncta*, Rbl., n. ab.; p. 83, *Hesperia carthami*, Hb., var. *major*, Rbl., n. var.; *Powellia orbifer*, Hb., ab. (var. gen. aest.) *minor*, Rbl., n. ab.; *Powellia sao*, Hb., ab. (var. gen. aest.) *minor*, Rbl., n. ab.; p. 84, *Hesperia alrens*, Hb., var. *alticola*, Rbl., n. var.

From the *Entomologische Zeitschrift Stuttgart*, xxiii., 1909, p. 17, *Brenthis pales*, Schiff., ab. *declarata*, Wagner, n. ab. (et var. ?); *Polyommatus icarus*, Rott., var. *sardoa*, Wagner, nov. var.; *P. meleager*, Esp., var. *dalmatina*, Wagner, nov. var.; *Ariadades bellaryus*, Rott., ab. *rufoumargyinata*, Wagner, nov. ab. (et var. ?); p. 18, *Cloantha hyperici*, F., var. *dilnitor*, Wagner, nov. var.; *Lencania comma*, L., var. *enyadiensis*, Wagner, nov. var.; *Taeniocampa stabilis*, View., var. *dalmatica*, Wagner, nov. var.; *Larentia infidaria*, Lah., ab. *nigrofasciata*, Wagner, nov. ab.; *Numeria pulveraria*, L., var. *saturaria*, B.H., i.l.; *Nychiodes lividaria*, Hb., var. *dalmatina*, Wagner, nov. var.; p. 23, *Œneis germana*, Auctant, ab. *depuncta*, Auctant, n. ab.; ab. *tristis* B.H., ab. *immaculata*, Auctant, n. ab.; p. 25, *Œ. dubia*, Elwes, var. *standingeri*, Aust., n. var.; p. 36, *Saturnia pyri*, Schiff., ab. *invittata*, Schultz, n. ab.; ab. *fulvescens*, Schultz, n. ab.; ab. *subdiaphana*, Schultz, n. ab.; *S. spini*, Schiff., ab. *fuscata*, Schultz, n. ab.; ab. *contigua*, Schultz, n. ab.; ab. *oblitescens*, Schultz, n. ab.; ab. *microphthalmica*, Schultz, n. ab.; ab. *subhyalina*, Schultz, n. ab.; *S. paronia*, L., ab. *flavomaculata*, Schultz, n. ab.; ab. *deflexa*, Schultz, n. ab.; ab. (♂) *ochreofasciata*, Schultz, n. ab.; ab. (♂) *decorata*, Schultz, n. ab.; ab. (♀) *saturatior*, Schultz, n. ab.; ab. (♀) *erythrina*, Schultz, n. ab.; ab. (♀) *angustata*, Schultz, n. ab.; ab. (♀) *conversa*, Schultz, n. ab.; ab. *defasciata*, Schultz, n. ab.; ab. *indentata*, Schultz, n. ab.; ab. (♀) *reducta*, Schultz, n. ab.; ab. *makropis*, Schultz, n. ab.; p. 41, *Pieris manni*, Mayer, gen. aest., *asta*, *Fruhstorfer, n. var.; var. *rossi*, gen. vern. *farpa*, *Fruhstorfer; p. 42, *Pieris rapae* var. *leucosoma*, Schwenda, gen. vern. *rava*, Fruhstorfer; *P. rapae* ab. *atomaria*, Fruhstorfer, n. ab.; *Neptis themis*, var. *ilos*, Fruh., n. var.; *N. sankara* var. *segesta*, Fruh., n. var.; p. 91, *Erebia ligea*, Linn., var. *takanonis*, Matsumura, n. var.; p. 121, *Anthrocera astragali*, Bkh., ab. *flava*, Kaufmann, n. ab.; ab. *flaveola*, Kaufmann, n. ab.

From the *Internationale Entomologische Zeitschrift Guben*, iii., 1909, p. 30, *Theretra porcellus*, L., ab. *galbana*, Gillm., n. ab.; p. 64, *Polyommatus icarus*, Rott., ab. ♂ *livida*, Gillm., n. ab.; p. 78, *Pieris*

* These show the difficulty of dealing with "trade" names; Fruhstorfer seems to name everything he gets for sale as "subspecies" or "form." We were under the impression that *rossii* and *manni* were the spring and summer forms of the same insect, but apparently Fruhstorfer has re-named them both!!—ED.

ergane, Hb.-Gey., ab. *niediecki*, Strand, n. ab.; *Pontia daplidice*, Linn., ab. *anastomosica*, Strand, n. ab.; *Colias edusa*, Fab., ab. *niediecki*, Strand, n. ab.; *Satyrus briseis*, Linn., ab. *uniocellata*, Strand, n. ab.; *Glauopsyche cyllarus*, Rott., ab. *sublugens*, Strand, n. ab.

In the *Berlin Ent. Zeits.*, iv., 1909, pp. 68-72, *Parnassius apollo* var. *silesianus*, Marsch.; pp. 73-75, *Lycaena areas*, Rott., ab. ♂ *emutata*, Marsch.; Proc. p. 3, *Epinephele jurtina*, L., ab. ♂ *hertha*, Heinrich; p. 36, *Agriades coridon*, Poda, var. *borussia*, Dadd; p. 39, *Parnassius mnemosyne* ab. *taeniata*, Stichel; ab. *arenaria*, Stichel.

In the *Polyxena Wien*, iv., 1902, p. 2, *Tephronia sepiaria*, Hufn., ab. *nigra*, Rebel; var. *lepraria*, Rebel.

In the *Entom. Rundschau*, xxvi., 1909, p. 59, *Lycaena cyane* var. *tarbayata*, Suschkin.

Notes on the cocoon-spinning of *Apanteles glomeratus*.

By GEORGE WHEELER, M.A., F.E.S.

As I had several larvæ of *Pieris brassicae* just lately, the greater part of which were ichneumoned, I had the opportunity of watching through a lens the emergence from the bodies of the larvæ and the cocoon-making of a number of the parasites (*Apanteles glomeratus*). When I first looked into the box in the morning over twenty grubs had emerged from the body of one caterpillar, 12 on one side, 8 on the other in compact groups, and 2 separately near the head. The most separated one began operations by making a pad on the bottom of the box by means of small circular movements of the head; it then began to double back on its own body, attaching the threads to it, each movement forming a loop, only limited in length by the distance to which the forepart of the body could stretch, this being the only part moved, but the loops were longer or shorter according as more or fewer segments were put in motion. These loops often caught in the course of formation, and were fixed in passing, by their own stickiness, to whatever they happened to touch, without cessation of movement on the part of the grub. Those that were in groups fixed many of their threads to the bodies of their companions. One of the larger group was turned away from the rest with its head towards the back of the caterpillar, and kept moving its head backwards and forwards in the most futile manner, being either unwilling or unable to fix a thread to the back of the caterpillar, eventually it turned and found itself able to attach its thread to the cocoons begun by others. The beginning of the cocoons is a common pad, but after a time each grub begins to work for itself so as to construct its own cocoon. They had all emerged and were beginning their cocoons by 9 a.m., and by 11.30 they were mostly covered, but the futile one was far behind the others, not more than two-thirds of its cocoon being formed. By this time a second batch was emerging from the body of another larva; each had made a circular hole in the larva's skin for itself; some emerged completely, but the greater number to about three-quarters of their length only, using the hole as a fixed point from which to work their bodies. Whilst I was writing a third larva had produced a batch of ichneumon grubs, which, in the course of those few minutes, had made considerable progress in their spinning. Each of these two batches consisted of 12 grubs. In the evening, at about 10.30, I happened to look in the box again just as the first of another batch was protruding from

the side of another caterpillar, and was able to see how the circular form of the hole in the larva's skin was brought about. The grub makes only a very small opening, through which it thrusts its head, and then works its body backwards and forwards, gradually enlarging the hole by distension, the skin at first moving in and out eversibly and retroversibly, until some two-thirds of the grub's body is visible. Those which make their cocoons from this position must emerge before the cocoon is finished, as one never finds any part of the cocoon embedded in the body of the caterpillar.

Notes on the Distribution and Variation of *Agriades coridon* in the Cambridge District.

By G. L. KEYNES.

In England, *Agriades coridon* appears to be almost entirely confined to chalky districts, and, in the neighbourhood of Cambridge, this is certainly the case, but, even on the chalk, it is not generally distributed, since it appears only at certain isolated points along the range of chalky hills, which stretch across the southern part of the county, from Newmarket, in the east, to Baldock, beyond the south-west boundary. This localisation is probably only secondary, since the species seems to occur in most of the localities suited to it, that is, in the places, where, for various reasons, the land has escaped cultivation. That there is no communication between the various colonies of this species seems to be indicated by facts to be mentioned later in connexion with its variation.

At the eastern end of the chalky range, the species occurs in some numbers on Newmarket Heath, though here it is to be found chiefly along the great prehistoric earthwork, known as the Devil's Dyke. The deep ditch on the western aspect of this earthwork affords the most complete protection for a species such as *A. coridon*, whereas the greater part of the heath itself is in constant use for horse-racing and exercising. Passing from here south-west along the Icknield Way, one finds the next stronghold of *A. coridon* to be another great earthwork, Fleam Dyke, which runs parallel to, and, in most ways, resembles the Devil's Dyke. The ground on either side of this dyke is under cultivation, but in the ditch and on the sides of the rampart *A. coridon* is to be found in great numbers. About a mile further on, *A. coridon* is to be found again along the course of the now disused Roman road, the Via Devana. The next point at which the species appears is some way further to the south-west, namely, on Royston Heath; this heath is of great extent, and may be considered to be the most important locality in the district for *A. coridon*, which occurs abundantly all over it. Beyond this region the country is all cultivated, and my investigations have extended no further.

Taking into account the type of country, the distribution is only what might be expected, and it is, in itself, of no particular interest; when, however, it is correlated with the variation of the species it at once becomes interesting and affords a striking instance of the peculiarities of local races.

The ♂ is of fairly constant form throughout the district, and presents only the usual amount of variation in size, in the breadth and intensity of the dark border upperside forewing, and in the shade (from

brown to pale cream) of the ground colour underside hindwing. The ♀, on the other hand, is peculiar in that it is found to be much more variable on Royston Heath than in any of the other localities. Thus, considering first the minor variation of the markings on the underside, one notices that it is usually possible to find at Royston a pronounced example of ab. *arcuata*, whereas I have not yet taken this elsewhere; at Royston also I have found a very complete ab. *obsoleta* and several intermediate forms, but very rarely have I noticed any approach to this elsewhere. In all the localities a form occurs with the discoidal spots, fore- and hindwing, ringed with white, but this, too, is perhaps commonest at Royston. With regard to the conspicuousness of the orange markings along the borders of fore- and hindwing, there is not much to be said; every degree of variation in this respect is found in all the localities.

There is a more striking variation to be found in the ground colour of the underside forewing. In a typical specimen of *L. coridon* ♀ this is of a fairly dark brown, and the black spots are ringed with white. In many specimens in this district the white has spread, until, in a number of instances, the wing has become, with the exception of the border and the spots, entirely white, as in the ♂. Occasionally the colour of the hindwing has become lighter at the same time, and it would not be easy to distinguish at sight such a specimen from a ♂ by the underside alone. This form occurs in all the localities, but is decidedly more frequent at Royston than elsewhere.

The most interesting variation of all, which it is the chief object of these notes to record, is found on the upperside, the normal brown of which is more or less replaced on the lower, or on all four wings, by the blue of the ♂. None of these specimens are quite as completely blue as in the extreme form known as ab. *syngrapha*, but many approximate to it. The majority of the aberrant forms have the lower wing all blue, except the upper fifth, and a variable amount of blue on the forewing, and are apparently included in ab. *semibrunnea*, Mill. It is also possible to find every intermediate stage between ab. *semibrunnea* and the typical ♀. Now it is very noticeable that these blue forms are found only on Royston Heath, where they have occurred regularly for the last four years, and are comparatively common. A rough attempt at estimating the proportions gave the result that one specimen in about every fifty or sixty has at least a well-marked blue hindwing. The ab. *semibrunnea* is very conspicuous and may easily be distinguished when flying from an ordinary ♀. I have searched carefully for ab. *semibrunnea* in the other localities during three seasons, but without success. I have one specimen from Fleam Dyke with the left forewing splashed irregularly with blue, and a few from the Devil's Dyke showing indications of blue on the hindwings; but that is all.

It is impossible to offer any explanation as to the reasons why this local race of blue ♀'s should have established itself only on Royston Heath, since the conditions are apparently very similar in all the localities.

There appears to be no relation between this upperside approximation to the ♂ form and the underside approximation mentioned above. Many of the ab. *semibrunnea* have the white underside forewing, but an equal number have quite typical undersides.

The ab. *syngrapha* seems to be found sometimes at Devizes (*Ento-*

mologist, 1896), at Ringwood (*Entomologist*, 1899), and elsewhere in North Wilts (*Entomologist*, 1902), but I can find no other English records of ab. *semibrunnea* having occurred regularly in this way as a local race.

It would be interesting to breed from some of the blue ♀s, and I hope some day to make the attempt, but it would probably not be an easy experiment to carry out.

In connexion with the distribution of species on the chalk, the following facts may be mentioned. *Urbicola comma* is abundant on Newmarket and Royston Heath, but I have never seen it on Fleam Dyke. *Satyrus semele* is plentiful both on Newmarket Heath and on Fleam Dyke, but seems not to occur on Royston Heath. *Eremobia ochroleuca* has the same distribution as the latter, whereas *Mesotype virgata* is common at Royston, but is not found elsewhere.

NOTES ON COLLECTING, Etc.

SWISS BUTTERFLIES.—In looking through a back volume of the *Ent. Record* I find I stated that *Aricia (Polyommatus) donzelii* was taken at Eggishorn in 1904 (see vol. xvi., p. 332); this is clearly a mistake, and refers to *Aricia (Polyommatus) eumedon*, an error which I hasten to correct with apologies. The year 1909 was almost a blank as far as butterflies were concerned. We arrived at Fiesch on June 22nd, *via* Lucerne and the Furka, and walked up the Binnen Thal to Binn without bagging anything of note. During the night there was a heavy thunderstorm and hailstorm, with three or four inches of snow to greet us in the morning; this, however, soon melted, and in the afternoon a few *Lycaena arion*, *Polyommatus escheri*, one *P. eros* and *Parnassius mnemosyne* were taken. The latter proved to be very plentiful, both near the village and further up the valley, and were in very fresh condition. *Pieris napi* var. *bryoniae* were also common, and flying with them were a few of the lowland form. *Erebia ceto* was fairly plentiful, and most of the specimens were so strongly marked as to be readily picked out from a series, though a few of the var. *obscura* were among them. Though the insects were somewhat disappointing the flowers were very fine, and, among other good things, such as *Primula longiflora*, the night-scented stock, etc., a pure white form of *Primula rusciflora* was noted. From Binn we went up to the Hotel Jungfrau, Eggishorn, but the weather grew worse instead of better, and two or three days of snow and wind did not provide better hunting. On July 3rd, we moved on to Riederalp, and here *Melitaea aurinia* var. *merope* was flying freely in the meadows, and showed a considerable variation in the depth of the black suffusion, but other insects were scarce, and on the 6th we walked down the steep path to Brigue, netting a few *Satyrus alcyone* and *S. semele* on the way. We hoped to take a few *Polyommatus meleager* at Martigny as a solace, but it poured in torrents and we packed up and made for Paris in despair. May 1910 provide us with a better season—it cannot easily be worse.—DOUGLAS H. PEARSON, Chilwell, Notts.

COLIAS VAR. HELICE AT BOURNEMOUTH.—Whilst staying at Bournemouth, a *Colias helice* was seen flying in Durley Chine on August 19th last. Neither species of *Colias* has been noticed by my brother, or

myself, in this locality this season.—JOSEPH ANDERSON, Chichester.
October 26th, 1909.

AGRIUS CONVOLVULI AT CHICHESTER.—An *Agrius convolvuli* was brought to me alive on October 18th. It is a small specimen, measuring under 4 in. from tip to tip of primaries.—JOSEPH ANDERSON.

LEUCANIA L-ALBUM AT EASTBOURNE.—I have much pleasure in recording the capture of a ♀ specimen of the above-named species on October 14th, at ivy. I have obtained a few ova, which, up to the present (26th inst.), have not hatched.—EDWIN P. SHARP, 1, Bedford Well Road, Eastbourne. October 26th, 1909.

CURRENT NOTES.

Mr. Schnept records (*Int. Ent. Zeits.*, p. 160) the occurrence of an imago of *Limenitis sibylla* with larval head. In the same paper (p. 159), Mr. Dziurzynski records a gynandromorph of *Bupalus piniarius*, at Perchtoldsdorf, in June last, the right side with male antennæ and wings, the left side female.

It hardly seems possible that it is 18 years ago since we helped the City of London Entomological Society to publish its first *Transactions* for the year 1891, but we have just received vol. xviii, for the year 1908, and it gives a strong hint as to the time that has passed since then. We have to congratulate the Society on its evidently sound and strong financial position, on the excellent paper by Mr. Prout on “*Cidaria truncata* and *C. citrata (immanata)*,” as well as that by Dr. Hodgson on “The notes on the effect of climatic conditions on sexual dimorphism.”

The obituary notice of the late Mr. J. A. Clark (accompanied as it is by an excellent photograph), strikes a sympathetic note in our own mind, for, whatever others may have done for the Society, Mr. Clark was the man to whom the Society has owed most, and the writer, who was the other member of the deputation that waited on Lord Avebury (then Sir John Lubbock) at the House of Commons (mentioned on p. 66), will not readily forget his eager excitement when the question of our getting rooms was being discussed, although most of the talking was left to the writer. We were hardly pressed in those days, and Mr. Hanbury deserves all the thanks so freely accorded in helping us out of our then difficulties.

In turning over the volume one is somewhat struck, and perhaps a little amused, at the mixture of what we may term the “old world” and “new world” synonymy found there, and, in the case of some of the latter names, we feel no shame in acknowledging that they are quite new to us. On the other hand, and apart from the misspelling of common words which one may safely put on the shoulders of the “printer’s devil,” the volume, although published so late in the year, shows evidence of hurried preparation rarely seen in any entomological periodical nowadays. This is most evident in Dr. Hodgson’s first class paper, where species and aberrations are written as *Aglaia*, *Corydon*, *Syngrapha*, *Icarus*, etc., sometimes with small, at others with capital, initial letters, without any sign of generic names, and when the latter are suggested, we get such indications as *B. rhamni*, *T. paphia*, etc., and wonder what it all means. Similarly, the presidential address is chiefly written with reference only to specific names, a form

of diction that those responsible will surely hardly care to defend. As opposed to this, on p. 14, the specific and generic names both get provided with capital initial letters, whilst the names themselves in the titles of the papers, rarely appear to agree with the notes about those papers in the Proceedings, *e.g.*, the "*Vanessa Urticae*" paper on p. 13, is referred to throughout in the Proceedings, p. 5, as "*Aglais urticae*;" the "*Gnophos Obscurata*," paper on p. 14, is referred to on p. 6 as "*Sciadion obscuraria*;" the "*Grapta c-album*" discussion on p. 14, becomes on p. 7 *Polygonia c-album*, etc. One might expect some uniformity, but we find "*Lycaena aegon*," and "*Polyommatus aegon*," on the same page (12). On p. 7 again, we find "*Trochilium tabaniformis*," on p. 8, "*Sesia tabaniformis*," evidently the same species, and on p. 4 the heading "*Zygaenidae*," and then read in the following paragraph of "*Anthrocera minos*," a six-spotted "*Zygaena*," "*A. filipendulae*," etc. We do not know who is responsible for "*ALUCITA*" *graphodactyla*, on pp. 60 and 10, surely *graphodactyla* cannot be *Alucita* without going back to Linné. It is an *Adkinia*, belonging to the Stenoptiliines, on the Plaptyptiliid side of the plume stirps, not even an Alucitine plume, let alone an "*Alucita*." Similarly, *brachydactylus* (p. 4) is called a "*Pterophorus*;" surely these things should be dead before a volume claiming a scientific position is given to the public. We may be told that the genera are in a state of flux; this may be so, but out of the flux there is surely no reason why, at least, some uniform method should not be adopted in the same book and on the same page. No doubt attention only wants to be called to this for the matter to be put right, but a volume that succeeds in its essentials should not be allowed to fail for want of attention to details. We write this with a light heart, not knowing who the members of the press committee are, or whether each member is responsible for his own paper, but, at any rate, by the time the next volume is issued, we trust that someone will be found to give the necessary attention to the matter. We wish to withdraw from these remarks, Mr. Prout's paper above referred to, which is, contrary to the rest of the contents, excellently edited throughout.

Another popular book entitled *Butterflies and Moths of the United Kingdom*, by Dr. W. Egnont Kirby, published by George Routledge and Sons, Ltd., London, has been forwarded to us for notice. It is illustrated by a large number of coloured plates, done by the three-colour process, the drawing of many figures of which is exceedingly poor. So unsatisfactory are some of the figures, that we had to turn to the index to see what they were meant to represent. We doubt if anyone could possibly guess what pl. xxxiv., figs. 4 and 17, xxxv., fig. 7, xxxvi., figs. 2 and 14, xxxviii., fig. 21, xl., fig. 16, and many others were intended to be, particularly if taken from their surroundings and examined separately. We were specially attracted to pl. lxvi., fig. 9, as something we could not decipher, and discovered that there was not a single species named correctly on the whole of the plate; even of those that could be made out, wrong names appear to have been applied to every figure. The figures of the plumes on pl. lxvii., are probably as unsatisfactory as anything in the volume. In the course of our study of this lovely order, we have never seen any plumes quite like those figured, and that which the explanation says refers to *pentadactyla*, can only be intended as an amazing caricature of this common,

but lovely, insect. The letterpress is unfortunately equally weak, especially the short odds and ends relating to the early stages. Thus we read that the larva of *Papilio machaon* feeds upon fennel, wild carrot, marsh milk-parsley, and other plants, "preferring the flowers." The larvæ of the species of *Argynnus*, live chiefly on violet "in August and September," and after hibernation in May and June. (Do larvæ of any of our three British Argynnids—*Argynnus adippe*, *A. aglaia*, and *A. paphia*, live "chiefly on violet in August and September?") The larva of *A. paphia* is said to feed on dog-violet, "raspberry, nettle, and guelder-rose;" the larva of *Issoria lathonia* to feed on violet, "borage, sainfoin," etc.; the larva of *Melitaea aurinia* to feed on scabious, "germander speedwell, plantain," etc.; the larva of *M. cinxia*, on "hawkweed, plantain, germander-speedwell, and other low plants;" the larva of *Polygona c-album*, on "wild currant, raspberry, hop, hazel, honeysuckle, nettle, thistle, sloe, elm, willow," etc.; the larva of *Nemeobius lucina* on primrose and "dock;" the larva of *Cupido minimus* on "vetches and other low plants;" that of *Agriades thetis* on "different species of vetch," etc.; of *Hesperia malvae*, on blackberry, raspberry, "teazle and other plants," etc.; *Cyclopides palaemon* on "plantain," crested dog's tail grass, "and other low plants." Such statements as these, which might have passed muster say 100 years ago, have surely all been put right in this year of grace 1909, and are not really worthy of criticism by serious lepidopterists.

There are many other items that are strange to us, e.g., the head of *Pyrameis cardui* pupa is said to have "the two projections usual in *Vanessa* pupæ;" pl. vi., fig. 5b, certainly does not show them, nor should it, of course. *Callophrys rubi* is "double-brooded," occurring in May and August. The British "coppers" include "*Lycena dispar*, Haw., *L. rutila*, Wernbg. (treated as a separate species from *dispar*, and noted as having "long been extinct"), *L. phlaeas*, Linn., *L. hippothoë*, Linn. (noted as "apparently extinct"), *L. viryanreæ*, Linn. (noted as "long been extinct"); then *salmacis* and *artaxerxes*, are treated as species separate from *Aricia astrarche*, and so on. We really should like to say something that would recommend the book to entomologists, especially as the publishers have evidently been at great pains and expense in its production: it will, no doubt, share honours with other books of a similar type selected by nonentomological parents and friends, as a gift to a child showing early predilections in an entomological direction, but for entomologists *per se*, the book can have no real value whatever.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 23rd, 1909.—OVA OF LEPIDOPTERA.—Mr. Tonge exhibited stereographs of the ova of *Nonagria edelsteni*, and of *Celastrina argiolus*. RARE AND VARIABLE LEPIDOPTERA.—Mr. Newman, series of *Dianthoccia conspersa*, with black forms from Shetland; *D. carpophaga*, with white forms from Eastbourne; *Dicranura bicuspis* from Tilgate; *Cneculia gnaphalii* from East Kent; *Cidaria reticulata* from Windermere; *Egeria andrenaeformis* from North Kent, etc. CYMATOPHORIDÆ, etc.—Mr. Brown, a curiously-banded form of *Cymatophora fluctuosa*, and Mr. Carr, examples of *C. fluctuosa* and *C. duplaris*, and a series of *Boarmia repandata* with ab. *conversaria* from the Wye Valley. WHITE ABERRATION OF *RUMIA CRATÆGATA*.—Mr. Cowham, a white specimen of *Rumia*

crataegata. OUR ENTOMOLOGICAL AUTHORITIES.—Mr. Turner read a paper on "Our Entomological Authorities," and exhibited a number of volumes referred to, published in the first half of the nineteenth century. *October 14th, 1909.*—ABERRATION OF *VALESSA io*.—A specimen with the wings on the right side, noticeably smaller than those on the left, Mr. W. West. OVA OF *AGRIADES THETIS*, etc.—Ova of *A. thetis*, *in situ*, on undersides of leaves of *Hippocrepis comosa*, from Eastbourne; also young larvae of *Celastrina argiolus*, and larvae, and pupæ, and cocoons of *Nola albalalis*, Mr. R. Adkin. COLEOPTERA.—*Apion curtisii*, *A. brevicolle*, *A. pomonae*, and *A. urticarium*, from Deal, Mr. W. West. BRED DRYAS PAPHIA VAR. VALESINA.—A brood of 41 typical ♂s, 23 typical ♀s, and 13 var. *valesina*, the progeny of a captured ♀ var. *valesina*, Mr. E. Joy. A DOUBTFUL LUPERNIA.—A series of a *Luperina* taken by Mr. T. Baxter at St. Anne's-on-Sea, the specific position of which is doubtful, Mr. R. South. SECOND-BROOD EXAMPLE OF *SPILOSOMA LUBRICIPEDA*.—A specimen of *S. lubricipeda*, bred on September 8th, from a Deptford larva, Mr. H. Moore.

ENTOMOLOGICAL SOCIETY OF LONDON.—*October 6th, 1909.*—NEW NOCTUID.—Sir George Hampson brought for exhibition the unique example of a Noctuid moth new to science, captured in the neighbourhood of Aberdeen by Mr. L. G. Esson, and presented to the National Collection by the Hon. N. C. Rothschild. It would be necessary, he said, to constitute a new genus for it, as it presented characters not known to exist in allied species. BUTTERFLIES FROM DAUPHINÉ.—Mr. A. H. Jones exhibited examples of *Melitaea deione*, from la Grave, and aberrant forms of *M. didyma* from Digne, taken in July last. This is the first record of the former species occurring so far north in the French Alps, and the exhibitor deemed it noteworthy that the specimens showed a nearer affinity to the meridional form than to the var. *berisalensis* of the Rhone Valley in Switzerland. The *M. didyma* included one very fine aberration taken at Digne, Basses-Alpes, on July 16th, in which the black spots in the central area of the forewing were confluent, forming a broad black band: the outer margin broadly black, and this continued to the hindwing. NORTH AMERICAN CHRYSOPHANIDS.—Mr. G. Bethune-Baker showed a series of *Chrysophanus dorcas*, which occurs in North America from Labrador and Alaska down to Michigan, in marshy localities, and pointed out the peculiar characteristic of the egg, which was more Theclid than Chrysophanid. He also exhibited a finely radiated example of *Rumicia (Chrysophanus) hypophlaeas*, also a North American species. BREEDING EXPERIMENT WITH CHARAXES.—Mr. G. F. Leigh exhibited the ♀ parent and 21 specimens of the offspring of *Charaxes zoolina* var. *neanthes*. This result was obtained from ova deposited by the *zoolina* form of the ♀, and produced 4 ♂s and 2 ♀s like the parent, and 15 ♂s and 9 ♀s of the *neanthes* form. Last year the same result was obtained in a smaller degree, but the eggs on that occasion were obtained from the *neanthes* form of the ♀. All the specimens exhibited, the breeding of which was undertaken at the special request of Professor E. B. Poulton, will be placed with those shown last year in the Hope Department, University Museum, Oxford. The breeding of the two forms from ova has proved that they are one species. With regard to the examples exhibited, Mr. Leigh said that, although the *zoolina* form is consistent in both the wet and dry season, there are two quite distinct forms of the *neanthes* variety.

Some European Bees.

By PROFESSOR T. D. A. COCKERELL, F.Z.S.

During the past summer, my wife and I collected bees in several European localities, and, although the season was phenomenally poor, we were pleased to see in life many interesting species which we had only known as cabinet specimens. Our one really good day was at Troyes, in France, on August 8th. It was extremely hot, and we found a railway-bank covered with flowers, over which flitted *Pontia daplidice*, *Colias hyale*, *Pieris brassicae*, *Vanessa urticae*, *V. io*, and other butterflies. The following bees were obtained:—*Panurgus dentipes*, 2 ♂, one with head extremely large, constituting a form (var. *megacephalus*, n. var.) parallel with the variety *macrocephalus* of *P. calcaratus*; *Nomada lineola*, Panz., 1 ♀; *Ceratina cyanea*, Kirby, 1 ♀; *Stelis aterrima*, Panz., 1 ♀; *Osmia fulviventris*, Panz., 1 ♀; *Halictus scabiosae*, Rossi, 1 ♀; also another *Halictus* and a *Colletes* not yet determined; *Anthidium manicatum* var. *nigrithorax*, D.T., 2 ♂s; *Anthidium oblongatum*, Latr., 1 ♂, eyes in life, olive-green, with the anterior part reddish-black.

Anthidium, as commonly understood in Europe, includes at least two genera—

(1) *Anthidium*, type, *A. manicatum*, with no pulvillus, using cottony tomentum in making its nest, and (2) *Dianthidium*, type, the American *D. sayi*, having a pulvillus on the feet, and using resin in the construction of its nest.

Fabre has termed these two groups the "Cotonniers" and the "Résiniers." The subgenus *Proanthidium*, Friese, consists of a mixture of *Anthidium* and *Dianthidium*, but I propose to take as the type (none being designated by Friese) the first species, *A. oblongatum*, which, though approaching *Dianthidium* in some respects (especially the venation), is a "Cottonier," and has no pulvillus. The subgenus *Pseudoanthidium* (5 species) I have not been able to examine; but Friese's *Paraanthidium*, according to a specimen of *A. interruptum*, Fabr., in the British Museum, goes with *Dianthidium*, and having two years' priority, should perhaps supplant it. It represents, however, a quite distinct group, with the clypeus much broader in proportion to its length, and may probably be regarded as a distinct genus. The Palaeartic species usually referred to *Anthidium*, so far as known to me, may be classified as follows:—

ANTHIDIUM SERIES.

ANTHIDIUM, Fabr., 1804 (type *manicatum*, L.).

- (1) *manicatum* group.
- (2) *punctatum* group.
- (3) *montanum* group.
- (4) *variegatum* group.
- (5) *cingulatum* group.
- (6) *lituratum* group.

PROANTHIDIUM, Friese, 1898 (type *oblongatum*, Latr.).*P. oblongatum*, Latr., *P. undulatum*, Dours., *P. morawitzii*, D.T.

DIANTHIDIUM SERIES.

DIANTHIDIUM, Ckll., 1900 (type *sayi*, Ckll.).

- (1) *bellicosum* group.
- (2) *ferrugineum* group.
- (3) *sticticum* group.
- (4) *septendentatum* group.
- (5) *strigatum* group= subg. *Anthidiellum*, Ckll., 1904.

PARAANTHIDIUM, Friese, 1898 (type *interruptum*, Fabr.).

DECEMBER 15TH, 1909.

Dianthidium extends even to Australia; I am greatly indebted to Mr. Rowland E. Turner for a specimen of *Dianthidium turneri* (*Anthidium turneri*, Friese, 1909), taken in November, at Mackay, Queensland.

Other captures of the past summer were—

(1) Wangen, Baden, at the famous Eningen fossil quarries, *Bombus variabilis* var. *notomelas*, Kriechb., August 5th.

(2) Gersau, Switzerland, July 30th, *Heriades truncorum*, L., *Bombus lapidarius*, L., *B. terrestris*, L., *B. hypnorum*, L., *B. agrorum*, Fabr. In hard cells on the face of the rock we obtained *Osmia adunca*, Latr., dead.

(3) Rigi Kulm, Switzerland (summit of the Rigi), August 1st, *Psithyrus rupestris*, Fabr., *Bombus lapidarius*, L., *B. terrestris* var. *autumnalis*, Fabr. The last is not quite true to type, having the first (thoracic) band distinctly tinged with yellowish. The top of the Rigi was rather disappointing, being much grazed by cattle.

(4) Kew Gardens, Surrey, July 20th, at flowers of *Spiraea japonica glabrata*, *Bombus lapidarius*, L., *B. terrestris*, L., *Prosopis* sp. (*annulata* ?), and *Andrena* sp.

Various small species, *Halictus* and *Prosopis*, and a single male *Andrena*, have not yet been determined. Not a single *Megachile* was seen during the summer. At Richmond, Surrey, I took a specimen of *Halictus smethmanellus*, which resembles a French specimen in the British Museum, but is not like the British specimens there preserved, these being not nearly so bronzy. Saunders admits only one British species which can possibly include these specimens, but if I received them from some remote country, I should think I had two different things.

At South Kensington, in the Natural History Museum, I found a *Bombus terrestris* var. *lucorum*, L.

Further notes on *Abraxas grossulariata*.

By (REV.) G. H. RAYNOR, M.A.

Before recording my experiences in breeding this species during the last two seasons, I feel that I must make some reference to Mr. Porritt's article on this same insect in your June number (*anteà* p. 181). My article (*anteà* pp. 87-8) which he comments on, was intended to be merely a criticism of the prices given for "Magpies" at the recent "Maddison sale," but, unfortunately, I put my foot in it by concluding with the remark that, although the current value of normal *varleyata* and *lacticolor* seemed to be about 10s. each, better, and consequently more valuable, aberrations could be obtained of the latter than of the former. Such a remark I might, perhaps, never have made had I known about the great variability of the series of *varleyata* Mr. Porritt exhibited in London on December 2nd last. But I must really join issue with him as to the *legitimacy*, and even the interest, of obtaining specimens from the egg, compared with rearing them from wild larvae. Surely if Mr. Porritt himself took a typical female of *Tanagra atrata* at Dalton, and was lucky enough on the same day to take a pure white male at Rastrick, he would not refrain from attempting to pair them! Personally, I cannot see why the progeny of such pairing should be less valuable or interesting than if they resulted from natural pairing between the parents out-of-doors. The white and black *T. atrata*, being born fairly near one another, *might* have paired naturally, but the chances of Mr. Porritt or any other naturalist discovering the resulting larvae would be infinitesimal.

Well, such a *potential* pairing was effected by me between ab. *lutea* and ab. *lacticolor* (of *Abraxas grossulariata*), obtained from adjoining parts of the same town in Lancashire, and it is from this pairing that I have obtained recently nearly all my best forms of *lacticolor*.

Then, of course, during the ten years I have been breeding this variety, I have continually introduced fresh blood into the race, so that I may be said to have been breeding from several different strains, and not entirely from *tame* strains, as is often the case with those who rear domestic pigeons and barndoors fowls. A more apt comparison might, I think, be made between the remarkable *lacticolor*, very occasionally reared by myself, and the magnificent *Narcissi* evolved by Messrs. Barr (among others), as the result of rearing many thousand seedlings during a course of years. That their efforts are fully appreciated by horticulturists is proved by the prices they are able to obtain for their very choicest kinds. When I started growing *Narcissi*, in 1903, the price asked for a bulb of "Peter Barr" was fifty guineas, and nowadays, "Czarina" and "Jaspar" fetch £30 apiece. Were there as many wealthy cognoscenti among entomologists as among floriculturists, eight guineas and a half would certainly not be the highest figure realised by an aberration of our old friend *Abraxas grossulariata*.

But, setting aside all pecuniary considerations, I will now proceed to the subject indicated in the heading of my present article by remarking that larvæ of the "Currant Moth" were extremely abundant both in 1908 and 1909. In the former of these years I obtained, by exchange and purchase, a very large number of larvæ, chiefly from Lancashire, Yorkshire, and the west of England, but beyond a few nice *hazeleighensis*, and approximating forms, I got nothing of any considerable interest. So this year, 1909, I determined to confine my efforts to my own neighbourhood, in which I collected some three thousand larvæ. These produced very few moths worth setting, the best being a pale speckled form near *lactea-sparsa*, a grand *nigro-sparsata* heavily dusted with bluish-black, and a single specimen approaching *albomarginata*. I am able, however, to report much greater success with my larvæ reared from the egg, and think it worth while to record here, and name, a few of the more prominent forms, starting with—

VARIATIONS OF AB. *flavofasciata* (= *lacticolor*).

- ab. *iochalcia*, n. ab.—A form with the ground colour entirely suffused with bronze-violet, varying somewhat in intensity.
- ab. *chrysostrota*, n. ab.—With ground colour entirely suffused with gold. This, like the preceding form, first appeared in my breeding-boxes in the autumn of 1908. They both result from the crossing of *lacticolor* with *lutea*, and are surpassingly beautiful.
- ab. *nigricostata*, n. ab.—With a broad black stripe extending along about three-quarters of the costa, more rarely reaching the apex. The other black markings being much reduced, the costal stripe shows up very conspicuously. One of the rarest forms of *lacticolor*.
- ab. *nigrovenata*, n. ab.—Remarkable for the blackening of the chief veins in the central area of the forewings.
- ab. *gloriosa*, n. ab.—A combination of the last two forms, i.e., *nigricostata* and *nigrovenata*. A truly grand insect.
- ab. *lactea-nigra*, n. ab.—With the dark markings on the forewings, and the marginal spots on the hindwings, black.

The above are all of Lancashire origin.

VARIATIONS OF *grossulariata*.

ab. *cuneata*, n. ab.—Distinguished from the type by a wedge-shaped horizontal black stripe joining the seventh outermarginal spot to the central fascia on the forewings. It has also a similar, but less complete, band, extending from the third outermarginal spot on the forewings, to the central fascia. Three specimens bred from Hazeleigh, and one from Herne Hill.

ab. *cuprofasciata*, n. ab.—With fascia of forewings copper-coloured. Bred from Bristol, 1908.

ab. *igneofasciata*, n. ab.—With fascia of forewings fiery-red. Occurs in Lancashire, and does not seem very rare.

ab. *radiata*, n. ab.—With marginal spots on forewings radiated.

ab. *nigrofasciata*, n. ab.—Forewings with broad central black fascia containing but little orange or yellow.

ab. *infrafasciata*, n. ab.—With central row of black spots on upperside of hind-wings coalescing into a more or less complete band. Fairly common.

ab. *infrabifasciata*, n. ab.—Similar to above, but with an extra black band above the central one. Not uncommon.

ab. *nigrocaerulea*, n. ab.—A blue-black form of *nigrosparsata*, very thickly dusted on all wings, but with white interspaces between the black costal blotches and between the black outermarginal spots on both wings. Very beautiful and striking. One specimen, bred in 1908, from a cross between Lancashire and Yorkshire parents. A very similar one bred this year from a wild larva found in this neighbourhood (Hazeleigh).

ab. *rubrolutea*, n. ab.—All wings entirely suffused with bright reddish-orange. A glorified form of ab. *lutea*, and is of Lancashire origin.

ab. *albispaciata*, n. ab.—Forewings with broad white area between central fascia and outer margin. Bred from larva received from Leeds, 1908.

ab. *albipalliatata*, n. ab.—Forewings with broad white area (like a mantle) intervening between black basal blotch and discal spot, the area outside the latter being frequently much blackened. Bred from Huddersfield, 1908 and 1909.

ab. *flaripalliatata*, n. ab.—Same as last, but with luteous mantle. Of similar origin, but one of the parents being ab. *lutea* from Lancashire. The mantle in both these forms often contains one or two small black spots.

Of all the above aberrations I possess more than a single representative. Now and then I rear an absolutely unique form of this protean species, but think it hardly right to assign separate names to these great rarities. Every year I have succeeded in obtaining a new form or two (by dint of rearing many thousands of larvæ), but so far I have not been able to produce the pure white form which I named ab. *candida* in my original paper on this species, nor the pure black form which Mr. W. Beattie bred from Mickleham, and Mr. L. W. Newman from larvæ of ab. *varleyata*. This, I think, may be aptly called ab. *nigra*, n. ab. Should I be fortunate enough to rear either of these, I shall not say of *candida*, as Virgil did of horses, "color est deterimus albis," but in praise of *nigra*, I might be tempted to fire off the famous line "Rara avis in terris, nigroque simillima cygno."

Collecting in the Isle of Wight, with some additions to the Fauna.

By HORACE DONISTHORPE, F.Z.S., F.E.S.

Having taken a house at Ryde for August, I spent the whole of that month in the Isle of Wight, and was able to do a good deal of collecting. In the following notes I give the result, and also record all the additions I know to the fauna of the island. Mr. Champion has kindly supplied me with a list of some of his additions, as also one or two made by his son in August. The weather for the first fortnight was most beautiful, but after that it broke up, in fact we can only be said to have had two weeks summer this year. The species marked with an * are new to the 1909 published list.

COLEOPTERA :—**Badister unipustulatus*, Bon.—Several specimens taken in a ditch, Sandown (Beare). **Oodes helopioides*, F.—Sandown (G. C. Champion). *Harpalus melancholicus*, Dej.—Not uncommon at roots of *Galium* at St. Helens. *Harpalus parallelus*, Dej.—At roots of grass, Niton. **Pterostichus dinidiatus*, Ol.—One specimen on path, September (Taylor). **Laemostenus complanatus*, Dej.—Taken by C. J. C. Pool at Cambourne. **Anchomenus livens*, Gyll.—Beating carrion, etc., in the Whitfield Woods (Dollman and Donisthorpe). **Patrobus excavatus*, Pk.—Sandown (G. C. Champion). *Dromius vectensis*, Rye.—A specimen was swept by Professor Beare at Sandown; this is said to be "not uncommon and generally distributed in the south of the island," in Newbery's list. This is certainly not my experience, or that of any other collector I know; I have only taken four specimens in all the visits I have made to the island. *Drypta dentata*, Rossi.—Was taken this year at Lucombe, by Jeffery, Donisthorpe, Taylor, Beare, Mitford, and Pool. It is a good many years since it occurred before. **Bidessus geminus*, F.—Sandown, August (H. G. Champion). **Agabus chalconatus*, Pz.—Sandown (G. C. Champion). **Ilybius fuliginosus*, F.—In ditch, Sandown (Donisthorpe). **Ilybius ater*, De G.—In pool on cliff, Sandown (Donisthorpe). **Helophorus porculus*, Bedel.—St. Helens, August (Donisthorpe). **Ochthebius lejolisi*, Muls.—This interesting species was discovered by my friend Mr. Hereward Dollman and myself, in numbers, in pools of salt-water in rocks at Seaview in August. **Cyclonotum orbiculare*, F.—Sandown (G. C. Champion). **Cercyon quisquilius*, L.—Sandown (Taylor). **Oxypoda brachyptera*, Steph.—Under seaweed, Fishbourne (Donisthorpe). **Thiasophila angulata*, Er.—In nests of *Formica rufa*, Parkhurst Forest, April (Donisthorpe). **Calodera rufescens*, Kr.—Sandown, June, 1898 (G. C. Champion). **C. umbrosa*, Er.—In sand-pit, King's Quay, August (Donisthorpe). **Oculea castanea*, Er.—Sandown (Taylor). **Dinarda märkeli*, Kies.—In nests of *Formica rufa*, Parkhurst Forest, April (Donisthorpe). **Dinarda hagensi*, Wasm.—In nests of *Formica exsecta*, in Parkhurst Forest, April (Donisthorpe). **Notothecta flavipes*, Gr.—In nests of *F. rufa*, Parkhurst Forest, April (Donisthorpe). **Homalota gyllenhali*, Th.—In ditch, Sandown (Donisthorpe). **H. caesula*, Er.—In moss, St. Helens' sand-hills (Beare). **H. gramineola*, Gr.—Sandown (G. C. Champion). **H. vilis*, Er.—In ditch, Sandown (Donisthorpe). **H. euryptera*, Steph.—In carrion, Whitefield Woods (Donisthorpe). **H. nigricornis*, Th.—In carrion, Whitefield Woods (Donisthorpe). **H. germana*, Shp.—In carrion, Whitefield Woods and Quarr Abbey (Donisthorpe). **H. intermedia*, Th.—In carrion, Whitefield Woods (Donisthorpe). **H. aterrima*, Gr.—In carrion, Quarr Abbey (Donisthorpe). **H. fungi* var. *clientula*, Er.—Sweeping, Whitefield Woods (Donisthorpe). I have to thank Mr. Elliman for kind help with the names of the *Homalotae*. **Tachysa atra*, Gr.—On wall, Sandown (Beare). *Tachysa scitula*, Er.—Rather common on damp sand at Lucombe Chine in August. **Gyrophaena affinis*, Mann.—Evening sweeping, Whitefield Woods, August (Donisthorpe). **Oligota pusillima*, Gr.—In cut grass, Ryde (Donisthorpe). **Hypocyptus laeviusculus*, Mann.—Sweeping, St. Helens (Donisthorpe). **H. apicalis*, Bris.—On the wing, Ryde (Donisthorpe). **Tachinus bipustulatus*, F.—At "Cossus-infected tree," Ryde (Donisthorpe). **T. marginellus*, F.—Sandown (Taylor). **Stenus*

declaratus, Er.—Sandown (G. C. Champion). **S. fuscicornis*, Er.—Whitefield Woods, sweeping, August (Donisthorpe). **S. pallipes*, Gr.—Roots of reeds, Sandown (Beare). **S. canescens*, Rosen.—Sandown (G. C. Champion). **Platystethus alutaceus*, Th.—In damp ditch, Sandown (Taylor). **P. capito*, Heer.—Sandown (G. C. Champion). *P. nitens*, Sahl.—A series was taken in a ditch with *P. alutaceus* and *nodifrons*, at Sandown. *Bledius longulus*, Er.—Was abundant at Luccombe Chine. **Trogophloeus fuliginosus*, Gr.—On wall, Sandown (Beare). **T. pusillus*, Gr.—Sandown (G. C. Champion). **T. sp. ?*—Under sea-weed, Fishbourne (Donisthorpe); comes in the “*tenellus* group,” with cheeks longer than eyes, and eyes moderate, but distinct, I think. **Homaium striatum*, Gr.—On wall, Sandown (Beare). *Pseudopsis sulcata*, Newn.—Haystack refuse, Sandown (Beare). The only other Isle of Wight record is the specimen taken by F. Walker in 1834, from which the genus and specimen was described by Newman (*Ent. Mag.*, 1834, p. 13). *Cyrtusa paucilla*, Sch.—Evening sweeping in Whitefield Woods. **Anisotoma flaricornis*, Ch.—Evening sweeping in Whitefield Woods (Donisthorpe). *Necrophorus interruptus*, Steph.—Occurred on carrion in the Whitefield Woods. **Silpha 4-punctata*, L.—Bordwood Copse (Taylor). *Colon brunneum*, Lat.—Evening sweeping at Whitefield Woods and at Luccombe. *Actinopteryx fucicola*, All.—Abundant under sea-weed at Fishbourne. **Actidium coarctatum*, Hal.—A small series under sea-weed on the beach at Fishbourne, August (Donisthorpe). **Trichopteryx montandoni*, All.—In nests of *F. rufa*, Parkhurst Forest, April (Donisthorpe) [Named by Herr Ericson.]. **Cryptamorpha desjardinsi*, Guér.—Introduced species. On bunch of bananas, Sandown (Taylor). **Anisosticta 19-punctata*, L.—Brickfield, Sandown (Taylor); I subsequently swept it at St. Helens. *Hyperaspis reppensis* was swept at Sandown. **Scymnus ater*, Kug.—Whitefield Woods, sweeping, August (Donisthorpe). **Careinops 14-striata*, Steph.—Haystack refuse, Sandown (Beare). **Micropeplus porcatus*, Pk.—Sandown (G. C. Champion). **Pocadius ferrugineus*, F.—Whitefield Woods, sweeping, August (Donisthorpe). **Laemophloeus ater*, Ol.—Under bark, Shanklin (C. J. C. Pool). *Antherophagus pallens*, Ol.—Was swept in the Whitefield Woods, and at Limpet Run. **Atomaria gutta*, Steph.—Burnt House, Sandown (Beare). **Ephistemus globosus*, Waltl.—Haystack refuse, Sandown (Taylor). *Dermestes murinus*, L.—Occurred in dead birds, Whitefield Woods. *Limnichus pygmaeus*, Sturm., and *Georyssus pygmaeus*, F.—Were common on damp sand at Luccombe Chine. **Aphodius scybalarinus*, F.—Totland (H. G. Champion). *Agrius lativornis*, Ill.—A ♂ was swept in Whitefield Woods. **Microcara lirida*, F.—Sandown (Taylor). **Scirtes orbicularis*, Pz.—Sandown (G. C. Champion). *Malthinus balteatus*, Suf.—A pair were swept near Ryde. **M. atomus*, Th.—Sweeping, Luccombe Chine, August (Dollman). *Strangalia armata*, Hbst.—Was not uncommon in August in the Whitefield Woods, and *Liopus nebulosus* was also swept there. *Pogonochaerus dentatus*, Four.—St. Helens, dug out of ivy stems (Dollman and Donisthorpe). *Gracilia minuta*, F.—On post near dead hedge, Sandown. **Bruchus atomarius*, L.—Sandown (G. C. Champion). *Cryptocephalus bipunctatus*, L.—Again found this year by Messrs. Mitford and Pool at Niton. Newbery's record of this species in the “Guide” is most misleading and inaccurate. The first two specimens

taken of this species were the type form, which was new to Britain in 1907, by Mr. Mitford. It is true I took it in some numbers in 1908, but by sweeping long grass, not on sallow, birch, or oak, none of those trees being within a mile of the spot. *C. pusillus*, F.—Sweeping in the Whitefield Woods. **Chrysomela didymata*, Scrib.—Lucombe Chine (Taylor). **Galernella viburni*, Pk.—Abundant on guelder-rose, Whitefield Woods, August (Donisthorpe). *Longitarsus waterhousei*, Kuts.—Sweeping in the Whitefield Woods. **L. aeruginosus*, Foud.—On *Eupatorium cannabinum*, Lucombe Chine (Dollman). **Longitarsus balotae*, Marsh.—On *Ballota nigra*, Yar Bridge (Taylor). *Haltica coryli*, All.—Abundant on hazel in the Whitefield Woods. **H. pusilla*, Duft.—Whitefield Woods, August (Donisthorpe). **Phyllotreta exclamationis*, Thunb.—Brading 1907 (Beare). **Chaetocnema arida*, Foud.—Swept in the Whitefield Woods. Much less strongly punctured than *hortensis*, but smaller. **Psylliodes chrysocephala*, L.—Sweeping, Ryde (Dollman). **P. chrysocephala* var. *anglica*, F.—Sweeping, Ryde (Donisthorpe). *Cassida vibex*, L.—On thistles, Whitefield Woods, Ryde, and King's Quay. *C. rittata*, Vill.—Beare and I found it in the greatest profusion at the roots of *Arenaria maritima* at Blackgang Chine. Many specimens were immature when they were plain green without any stripe. When kept for some weeks the stripes developed. *C. nobilis*, L.—Roots of plants, St. Helens.—*C. nobilis*, var.—Dollman and I took four specimens of a *Cassida*, at roots of *Chenopodium*, at St. Helens, green, with a beautiful crimson horse-shoe on the elytra—the green the colour of the leaves, and the crimson that of the colour at the joints of the leaves and branches of the plant. We met Professor Poulton and Mr. Guy Marshall, and were able to show them how beautifully the beetle matched the plant in life. Of course, now dead, they are the usual dirty green colour. It may be a form of *nobilis*, as the marks on the head form a Y; the thorax is dull, and the base of the femora black. The general shape, however, is more that of *rittata*. **Helops pallidus*, Curt.—At roots of marram grass, St. Helens, August (Donisthorpe). *Oedemera lurida*, Marsh.—King's Quay, sweeping. **Meloe brevicollis*, Pz.—Limpet Run (Goldthwait). *Apoderus coryli*, L.—On hazel, Whitefield Woods, August. *Bytiscus betuleti*, F.—On hazel, Bordwood Copse (Poole). Why Newbery should suggest that this insect, recorded by Guyon on hazel, Shambler's Copse, should be *Deporaeus betulae*, it is impossible to understand. **Rhynchites uncinatus*, Th.—Sandown (Champion). *Apion difforme*, Germ., and *A. schönherrii*, Boh.—Whitefield Woods. *A. aeneum*, F.—Wooton Church. **Polydrusus pterygomalis*, Sch.—Whitefield Woods and King's Quay (Donisthorpe). **P. flaripes*, DeG.—Not uncommon in the Whitefield Woods, also at St. Helens, August (Donisthorpe). *Sitones meliloti*, Walt.—Abundant on melilot at Lucombe. **Hypera nigrirostris* var. *ouoninis*, Fow.—Lucombe Chine (Donisthorpe). *Tychius squamulatus*, Gyll.—Roots of *Lotus corniculatus* at Blackgang. *T. tomentosus*, Steph.—At roots, Lucombe Chine. **Cionus hortulanus*, Marsh.—On *Scrophularia*, Whitefield Woods (Donisthorpe). **Linnobaris pilistriata*, Steph.—Whitefield Woods, August (Donisthorpe). *Hylesinus crenatus*, F.—Taken in twigs of ash at Lucombe Common (Dollman, Beare, Taylor, and Donisthorpe). **Phloeophthorus rhododactylus*, Marsh.—Sweeping at

Sandown, August (Donisthorpe). This adds 82 species and 2 vars. to the list, which brings the total at present known, up to 1516.

HYMENOPTERA.—Several nests of *Formica exsecta*, were discovered in Parkhurst Forest in April. *Solenopsis fugax* was abundant, with *Lasius niger* and **Formica rufibarbis* var. *fuscorufibarbis*, at Sandown. *Myrmecina latreillei* was found sparingly at St. Helens. *Myrmosa melanocephala* ♂ and ♀s were taken at Luccombe Chine. Several small, very dark ♀s of *Methoca ichneumonoides* occurred in the latter locality. The following species new to the list, were taken. One new bee—**Nomada alboguttata*. Three sawflies—**Allantus arcuatus*, **Athalia glabricollis*, and **Emphytus rufocinctus*. Two Chrysids—**Hedychridium roseum*, Ryde, and **Notozus panzerii*, Sandown. **Pezomachus aquis-granensis* var. *neesi* was taken last year in a nest of *Myrmica laevinodis* at Sandown. **Pachylomma buccata* was captured, hovering over a nest of *Lasius niger*, at St. Helens. **Lagynodes pallidus*—two specimens taken in a nest of *Formica fusca* in Parkhurst Forest in April.

HEMIPTERA.—The following bugs occurred, kindly named for me by Mr. E. A. Butler—*Myrmus miriformis*, Fall., ♂ and ♀. Larva (nymph) of *Syromaster marginatus*, L., King's Quay. *Dolycoris baccarum*, L., Ryde. *Piezodorus lituratus*, F., Sandown. *Ælia acuminata*, L., Sandown. *Issus coleoptratus*, Creoff., Whitefield Woods. *Tettigonia viridis*, L., ♂, Whitefield Woods. *Rhynchosciara chiragra*, F., St. Helens. *Gnathoconus picipes*, Fall., St. Helens. *Solda littoralis*, L., King's Quay. **Corizus subrufus*, Gmel., Whitefield Woods. *Piesma quadrata*, Fieb., St. Helens.

DIPTERA.—**Phora formicarum*—Hovering over a nest of *Lasius niger*, at St. Helens. **Phryxe vulgaris*.—Four specimens bred from larvæ which came out of an emaciated Noctuid larva, found in the Whitefield Woods at roots of flea-bane. **Musillus subsaltans*.—Abundant on white sand at Luccombe. **Sargus iridatus*.—Sandown. **Theriaplectes distinguendus*.—Whitefield Woods [Kindly named for me by Mr. Collin.].

SPIDERS.—The following spiders are new to the list. **Thyreosthenius biorata*, Camb.—Taken in nests of *Formica rufa*, in Parkhurst Forest, in April. **Epeira alsine*, Wal., ♀, **Cercidia prominens*, West., ♂, **Pachygnatha listeri*, Clk., ♂s, **Xysticus ulmi*, Habs., ♂, **Curtulina guttata*, Wid., ♀, and **Phyllonethis lepida*, Walck., in the Whitefield Woods, August. I captured a young specimen of *Myrmarachne formicarius*, Walck., again with *Myrmica scabrinodis*, this time at Luccombe Chine.

Depressaria putridella, Schiff.—A species new to Britain
(with two plates).

By ALFRED SICH, F.E.S.

(Concluded from p. 257).

HABITS OF LARVA.—Nothing appears to be known of the egg-laying, ovum, or of the habits of the very young larva. Probably the species hibernates as an imago, and lays its eggs on the foodplant in the spring. Nolcken mentions finding the larvæ near Cannes, in various stadia, on May 15th, 1880, and he bred moths from these between June 13th and 19th. Here the species is not so early, the larvæ not being full-grown till the third or fourth week in June, and the moths appearing in the latter half of July and early August. In

the penultimate and the final stadium, at least, the larvae form tubular dwellings by drawing together several of the long very narrow segments of the leaves of the food-plant, *Peucedanum officinale*, L. In the early summer the plants are not very tall, and the leaves bend over like miniature weeping willows, so that the larval dwellings hang vertically, and are well hidden among the very numerous much divided leaves. These dwellings are lined with white silk and are quite open at the lower end, out of which the larva protrudes its anterior segments and eats all the leaf segments within its reach. The larva is very active, and if annoyed will leave its dwelling by the top, or by the lower end, and fall to the ground. When full grown it spins a slight cocoon of brown silk, which, in captivity, is placed on the floor of the cage among the *débris*.

LARVA.—I have only seen one larva in the penultimate instar, and this had a shining black head, width 0.9mm., and anal plate of the same colour. The full-fed larva is 17mm. in length, slender, and slightly attenuated posteriorly. The head, 1.3mm. in width, is ochreous-brown. The large prothoracic shield is pale ochreous with a broad whitish anterior margin, a moderately wide central whitish line and a posterior whitish border. The rest of the prothorax very pale grey-green. The colour of the body is olive-green, the dorsal vessel showing darker. The legs are pale ochreous and the prolegs olive-green. The anal shield large, pale ochreous or, sometimes, black. Spiracles black-ringed. The tubercles are black, set in pale rings, and the simple setae are ochreous. The segments, subsegments and flange well marked (Described June 26th, 1909). On the abdominal segments the first subsegment carries tubercles i and iii and the spiracle; tubercles iv and v, subspiracular, on a common plate, and vii, are all on the anterior portion of the segment; vii consists of three tubercles in a row, on a common plate, the posterior tubercle carrying a seta nearly twice as long as the other two. Tubercles ii, each with a very long seta, and vi are placed on the posterior part of the segment; iii is doubled on the thoracic segments. The meso- and metathorax have a large additional tubercle behind iv; this is also present on the prothorax, but is small. The prolegs have a complete circle of crochets.

PUPA.—The pupa belongs to the obtect division, having only the 5th and 6th abdominal segments free. It is rather stout, glossy, and reddish-brown. The ventral aspect shows us the head and eyes. Beneath these are two long triangular spaces, which cover the maxillæ and the large labial palpi, and, I think, also, the minute maxillary palpi. Outside these spaces are the first pair of legs, beyond these the second pair of legs, and then the antennæ, which are continued to the apex of the forewings, where they turn outwards and allow the ends of the third pair of legs to appear. The forewings reach to the end of the 4th abdominal segment. The scars of the prolegs are conspicuous on the 5th and 6th abdominals. On the cremastral area are short hooked bristles. The spiracles are not very prominent, except the abortive one on the 8th abdominal. There are many short, sharp, minute spines round the spiracular area. The tubercles, say, on the 6th abdominal, are the trapezoidal (i and ii); one above the spiracle (iii) and two below (iv and v), and one still further down (vi) on the posterior part of the segment, and two or three near the foot-scar (vii). These are all furnished with a seta.

PARASITES.—The larvae I had were very much attacked by parasites, one external and the other internal, both hymenopterous. The larva of the external parasite is attached to the intersegmental membrane of the host, usually on the dorsum of the thorax, and, here, it apparently remains till fullfed. It appears as a shining, whitish, deeply segmented, limbless grub, lying across the dorsum of the host, in the suture, between two segments. The caterpillar, carrying the parasite about with it, continues feeding apparently without much discomfort, and spins its cocoon in the usual way. The parasite, however, does not cease feeding when its host does, but goes on sucking the juices until nothing but the skin of the caterpillar is left. The parasite then spins its own cocoon, which is cylindrical, with rounded ends. It seems to me that the caterpillar is only attacked by this parasite when in the last stadium, for it could hardly undergo successfully an ecdysis with the parasite attached, and when once the parasite has become free of the caterpillar (though only half grown), it seems quite unable to reattach itself. Rarely two occur on the body of the same host. I have not yet bred this ichneumon. The larvae appear to be still alive and unchanged in their cocoons; I have forwarded them to Mr. Claude Morley. The other parasite, a minute black hymenopteron, has emerged in hundreds. In this case the caterpillar appears quite healthy, and spins its cocoon in due course, but no moth appears when it ought to do so, and when the cocoon is opened the stiffened, and rather swollen, body of the caterpillar is seen, generally lying at full length. Inside the body are a multitude of minute whitish grubs, which pupate inside the larval skin. On emergence the "flies" make holes in the larval skin and escape. This parasite was far more common than the other, and must destroy great numbers of the caterpillars. Mr. Morley informs me that it is a Chalcid.

TIME OF APPEARANCE.—Larvae, May and June. June 21st, 1909, nearly all the larvae seen were in the last instar. July 17th, bred first imago, and the last July 25th.

BRITISH LOCALITIES.—Kent: Whitstable. Possibly also at Kirby, near Walton-on-the-Naze, Essex, as the food-plant has been noted as growing there.

DISTRIBUTION.—Austria: Vienna (Schiffermüller, Mann). France: Golfe Juan (Constant), Paris (Ragonot). Germany: Halle (Stange), Regensburg (F. Hoffmann), Wiesbaden (Roessler). Staudinger mentions Hungary. It seems possible that the species might also occur in Holland.

HISTORICAL ACCOUNT OF THE SPECIES.—We first find mention of this species in the *Wiener Verzeichniss* (1776) under the name of *Tinea putridella*. It is there placed under the section with recurved palpi, and under the group with the forewings broad and rounded, and is described as "wood-brownish *Tinea* with a small white central spot." If we understand by wood-brownish the colour of oak wood, the description, though laconic, is not bad, and no doubt, served the authors of the catalogue very well for distinguishing this species from any other, they knew, having the same structure. So short a description is now, when we know so many species, of no very great value, happily, however, Hübner figured a specimen of this species, obtained probably from the Vienna entomologists. Zeller states that Fischer von Roeslerstamm was convinced that Hübner's figure represented the

true *putridella* of the *Vienna Catalogue* by seeing the Schiffermüller collection (*Linn. Ent.*, 1854, p. 219). He further states that Fischer found other Depressariids in the collection (*op. cit.*, p. 334 and p. 342). Fischer himself, writing from Vienna, in 1842, states that he recognises in the remains of a specimen then in the collection, the Tineid, *Ochsenheimeria taurella*, and says that Hübner's fig. 188 is not that species, but *racculella* (*Stett. Ent. Zeit.*, 1842, p. 205). This proves that Fischer saw the collection and compared the specimens with Hübner's figures, and we may, therefore, accept Zeller's statement concerning Hübner's figure of *putridella*. Illiger, in the second edition of the *Vienna Catalogue*, 1801 (p. 100), mentions the species and cites Hübner's figure. He did not know the species in nature, and, therefore, places a † against it. Charpentier evidently saw the species in Schiffermüller's collection, as he makes no note to the contrary against the name (*Charp., Z.W.S., &c.*, 1821, p. 30). Although Herrich-Schaeffer in mentioning the species adds "Mus. Schiff.", he gives only a meagre account of the species, because, as he says, he only knew it from a figure, received from Fischer von Roesslerstamm. Indeed, he goes so far as to say, "the position of this species is very insecure, it should rather be disregarded altogether." His figure, probably reproduced from that by Fischer, who possibly drew it from the specimen in Schiffermüller's collection, is very fair. The central shade, however, is curiously broken up into three parts, the last not reaching much beyond the white discoidal spot, the hind-wings are much too pale at the anal angle (*Sys. Bearb. Schmett. v. Europa*, vol. v., p. 120, pl. 62, fig. 450). As we shall see later, Herrich-Schaeffer afterwards became better acquainted with this species. It seems probable that the first German specimens were taken at Regensburg, and that the food-plant was discovered there.

Zeller gives an excellent description of the species (*Linn. Ent.*, vol. ix., p. 218, 1854) from the only specimen he had seen, a male from Mann's collection, taken near Vienna. He discusses both Hübner's and Herrich-Schaeffer's figure, and comes to the conclusion that, as both differ from the specimen he describes, the species probably varies somewhat. As Zeller only cites "Austria," and had only one specimen before him, it would seem that the species was, even then, only known from the Vienna district. It seems also probable that when Zeller wrote this description he had not then decided on the order in which the species should follow each other in his monograph, and that he had contemplated placing *D. putridella* immediately after *D. umbellana*. For the opening paragraph commences with the words "Viel kleiner als die vorige," and offers other points of distinction. This paragraph evidently refers, not to the preceding species, which is *D. nanatella*, Stt., but to *D. umbellana*, and agrees well with Zeller's remarks (*op. cit.*, p. 210). In the second paragraph, he says, "size of *culcitella* or *nanatella*. Thorax darker than in *umbellana*." This is further evidence in the same direction. Roessler mentions that one specimen was taken, in August, near Wiesbaden (*Verz. Schmett. Nassau*, p. 230, 1866). In the second edition of this work (*Schuppenflügler*, p. 283, 1881) he states that the species is rare, and that, according to Ernst Hofmann, the larva feeds on *P. officinale*, in tubular dwellings at the ends of the leaves. The imago seldom observed (*Verz. Schmett. Halle*, p. 87, 1869). Von Heinemann, in his usual manner, gives an excel-

lent description of the imago, and cites "Vienna" and "Regensburg" as localities (*Schmett. Deutsch.*, iii., Heft 1, p. 147, 1870).

In vol. xii. of his *Nat. His. Tin.*, p. 194 (1870), Stainton gives a description, under the name of *putridella* (i.e., the type), of the ab. *brunnea* of this species and figures it on plate vi, fig. 3m. His figure of the larva (3a) on the same plate is very good. Perhaps the chief interest in this account lies in the Latin version of the "geographical distribution." This was, I believe, written by Zeller, and differs slightly from those in the other languages. It is here stated that one example of the species was taken many years before, near Vienna [=that in Schiffermüller's collection], then the insect was almost forgotten, till another example was found in the same district [=that taken by Mann]. From this it appears that, anyhow, up to 1854, when Zeller wrote his monograph on the genus *Depressaria*, there were only two specimens known. Even in 1861 Stainton did not possess a specimen. Later it occurred commonly at Regensburg, whence, in 1865, Stainton received larvæ from F. Hofmann (*ibid.*, p. 197). If this be true, it follows that Hübner's figure was taken from the actual type in the Vienna collection. The larvæ of the southern form of this species, var. *peucedanella*, and of the ab. *esterella*, were discovered on May 5th, 1880, by Baron Nolcken, Constant, and probably Millière, when these three entomologists were on an excursion in the Esterel. They did not then know the name of the plant, on which the larvæ occurred in various sizes, but it was subsequently found to be *Peucedanum officinale*. They all took larvæ, and, in the June following, Nolcken bred five moths which he could not separate from *D. putridella*. On the other hand Millière and Constant, both of whom had also bred moths, were of opinion that they had a new species before them. They probably did not know *D. putridella*, and, if they only had Hübner's figure with which to compare their specimens, it is quite excusable that they failed to connect the figure with their specimens. Millière wrote to Nolcken, that he would describe and figure his moths under the name of *peucedanella* together with a paler variety. Nolcken then again examined his French specimens, but was quite unable to find any specific distinction between them and *D. putridella*. He further states that he received his *putridella* from Herrich-Schaeffer himself, and that, therefore, they were correctly named. He had also received a dark example from Mann, as *peucedani*, Hofmann, *in litt.*, which was therefore also probably bred from *Peucedanum*. Whether or no Nolcken communicated his views to Millière does not appear (*Stett. e. Zeit.*, p. 190, 1882). In due course Millière described and figured his *peucedanella*, as a new species, but it seems curious that, in doing so, he does not even mention *putridella*, much less compare his species with that. He consulted Ragonot, who also apparently ignored its identity with *putridella*, and suggested its proper place would be between *hippomarathri* and *cachritis*. This is curious, too, because Ragonot must then have known *putridella*, for he sent specimens to Stainton from Paris, which are now in the British Museum, and are labelled "Paris, Ragonot, 3/74." In his description of the larva, Millière states that the head of the full-grown larva, as well as the anal plate, is entirely black. In Stainton's figure, and in all the full-grown larvæ I have seen, the head is ochreous. The anal shield is either black or ochreous, and I think Millière mistaken when he suggests that the ochreous-

coloured anal shield is a feature only belonging to the ab. *esterella*. His description of the imagines is good, and he states that the ab. *esterella* is almost as abundant as the form *peucedanella*. Judging from his description, and from the specimens in the Stainton collection, his neat figure of *peucedanella* is too light in colour (*Ann. Soc. Sc. Nat. Cannes*, p. 13, pl. x., figs. 14 and 15, 1880*).

A Lepidopterist's Summer in Central Italy.

By GEORGE WHEELER, M.A., F.E.S.

(Concluded from p. 253).

On July 27th we drove to Gubbio and back across the Apennines, 35 miles each way, starting at 4 a.m. This would be a most interesting district entomologically, but my opportunities of testing it were very limited. The following species, however, I made sure of, either by actual capture, or by seeing them too close to be mistaken. *Erynnis alceae*, *Nisoniades tages*, *Augiades sylvanus*, *Thymelicus acteon*, *Agriades coridon*, *Polyommatus icarus*, *Plebeius aegon*, *Celastrina argiolus*, *Pieris brassicae*, *Pontia daplidice*, *Leptosia sinapis*, *Colias edusa*, *C. hyale*, *Pyrameis atalanta*, *Vanessa io*, *Polygonia egea*, *Pararge megaera*, *Satyrus hermione*, *Hipparchia briseis*, *H. semele*, *Epinephele jurtina*, *Coenonympha pamphilus*, *Melanargia galatea*, and either *Pieris rapae* or *P. manni*, as well as a black and white skipper, probably a large form of *Hesperia malrae* or possibly however *H. alreus* or a small *H. carthami*.

On July 28th a fresh brood of *Melitaea didyma* began to appear on the cemetery road, at Assisi, both ♂s and ♀s being typical, and showing no tendency either towards the *meridionalis* or the *occidentalis* forms; this continued to be common throughout August. On the same day I took a very pronounced example of *Melanargia galatea* ab. *leucomelas*, which however is unfortunately far from perfect, having lost a largish piece of one forewing. On the following day the first specimen of a new brood of *Melitaea phoebe* made its appearance, and, on July 30th and following days, I found it abundantly on the vetch-fields, in the plain south of the town. It is a smallish, rather lightly marked, form, with a bright fulvous unicolorous ground, nearer to some of the Spanish than to the usual Swiss forms, but without any tendency to the *occitanica* colouring, except very occasionally a slightly lighter yellow here and there. These same fields were swarming with *Plebeius aegon*, a second-brood, differing in most specimens from the first by its lighter underside, which in some specimens is quite white. This is the first time I have come across a second brood of this species, but it was abundant here, and I found it also common at Perugia, Orvieto, and Siena. Almost equally common in the same fields, was a new brood of *Polyommatus icarus*, the ♂s of a deep rich royal blue, some specimens being markedly of the *celina* form, with a row of black spots round the hindwing; the undersides are of a smoky-brown, and the specimens very large; the ♀s, on the other hand, are by no means large, but the orange is well-marked, forming a continuous band on both wings on the underside, the ground colour of which is a rich

* Millière's contributions to this Society have been published separately, under the title of "Millière, Lépidoptérologie."

coffee-brown ; the form *icarinus* is not uncommon in either sex ; the ♀s have rarely any touch of blue on the upperside. On July 31st, I took the only Argynnid I saw in Italy, a large specimen of *Argynnis adippe* showing no tendency to the *cleodoxa* form, the ground colour, on the other hand, having a suspicion of a silvery sheen, and the silver spotting being very pronounced.

On August 6th we left our very comfortable quarters at the Hotel Giotto, which I most strongly recommend to anyone visiting Assisi. The windows command an uninterrupted view of the Tiber Valley and the mountains beyond, as well as the hill towns of Spello, Trevi, Spoleto, Montefalco, etc., and in the other direction Perugia stands out magnificently. It is a most "homey" hotel, and the landlord and his sons, one or more of whom is always at home, make their visitors most comfortable. Of Assisi itself and its interests, whether entomological, artistic, or religious (especially if one can be there for the "Perdono" at the beginning of August, when it is full of picturesque pilgrims from the mountains and the south), it would be impossible to write too enthusiastically—one leaves it with the keenest regret, and returns to it with the keenest delight.

Our next stopping-place was Orvieto, but, as our train waited for more than an hour in Perugia station, I took my net into the neighbouring lane, turning to the right, and found some fourteen species of butterflies, including *Limenitis camilla*, *Pararge eyeria*, *Issoria lathonia*, and *Haywardia telicanus*. Our first day at Orvieto was spent in visiting Bolsena ; here *Pyrameis atalanta* was in some numbers, and on the way there I took amongst other things *Pararge moera* and *Epinephele tithonus*. It is a curious fact that I never found *E. tithonus* and *E. ida* overlapping. On the hill on which Orvieto is built, I found *E. ida* only, on the opposite hill going towards Bolsena *E. tithonus* only ; at Assisi and Florence I have only seen the former, at Siena only the latter. This may be mere coincidence ; has any other entomologist noticed the same, or an opposite state of things elsewhere ? The only other capture of special interest at Orvieto, was a ♀ *Erres alcetas*, in the neighbourhood of the painted Etruscan tombs at Settecamine. On August 11th we moved on to Siena, where I had not much opportunity of collecting, but on each of the three days when I did some hunting in the neighbourhood of the town itself, I took *E. alcetas* mostly in good condition ; *Polyommatus icarus* of the *celina* form fell to my net on August 14th, on August 17th the only specimen I saw of *Colias edusa* var. *helice*, and on August 19th another specimen of *Pararge moera* : neither this nor the Perugia specimen, one being ♂, the other ♀, are of the *adrasta* form, as one would have expected them to be. On August 20th we drove to Monte Oliveto, and by starting to walk back until the carriage overtook me, I succeeded in taking several species, including fresh *Pontia daplidice* and *Agriades coridon*, and the only *Satyrus statilinus* which I saw on this occasion. I also took both *Epinephele tithonus* and *E. ida*, but, as at Orvieto, on different hills.

We had intended going from Siena to San Gimignano for a week, and thence for another week to Porto Ferraio in the island of Elba, but after two nights of earthquake on August 24th and 25th (the shocks on the former night being really very bad, and one lasting for fourteen seconds, which seems interminable), the ladies decided on

returning to England, as the one place was well within the affected district, and the other had actually been well shaken up; consequently the Monte Oliveto expedition ended my hunting experiences in Italy for this year at any rate, experiences which had been very interesting, although the actual number of species with which I was not acquainted in Switzerland was but five, viz., *Hirsutina dolus*, *Polygona egea*, *Brenthis hecate*, *Epinephele ida*, and *Coenonympha dorus*.

I append a list of the butterflies taken by me in Italy on this and previous occasions, with their localities and dates. Whenever no year is mentioned, the entries refer to 1909.

Erynnis laraterae, Iselle, July 15th, 1905. *E. althaeae*, Iselle, July 15th, 1905. *E. alcea*, Iselle, July 15th, 1905; Perugia, September 20th, Assisi, September 25th, 1907; Assisi, Orvieto, June 28th to August 9th. *Hesperia carthami*, the *Carceri* (Assisi), July 9th. *H. alveus*, Assisi, September 25th, 1907, June 26th, 1909. *H. malvae*, Assisi, July end and August beginning, Siena, August 14th-19th. *Pyrgus sao*, Fiesole, June 21st, Assisi, July 2nd, etc., Perugia, August 6th. *Nisoniades tages*, Assisi, July 19th, etc., Siena, August 14th, etc. *Augiades sylvanus*, Assisi, from June 1st, onwards, Siena, August 17th. *Urbicola comma*, Fiesole, August 27th, 1906. *Thymelicus acteon*, Fiesole, Assisi, mid-June to early August, very common. *Adopaea lineola*, very common everywhere throughout summer. *Heteropterus morpheus*, Fondo Toce (Pallanza), in wood close to station, July 25th, 1906, abundant, July 4th, 1907, one only. *Geyenes nostradamus*, Val d'Ema (Florence), September 12th, 1907, one only. *Heodes viryaureae*, Iselle, mid-July, 1905, July 10th, 1906, 1907. *Lowia alciphron* var. *gordius* and ab. *intermedia*, Iselle, mid-July, 1905, July 10th, 1906, 1907; Varzo, July 17th, 1905. *Rumicia phlaeas*, Perugia, September 20th, 1907; Fiesole, June 18th; Assisi, from June 26th, onwards. *Lycaena iolas*, Assisi, June 28th, one worn ♀ only. *L. arion* var. *obscura*, Iselle, July 10th, 1907. *Cupido minimus*, Assisi, mid-July, very scarce. *C. sebrus*, Assisi, July 23rd, one ♂ only. *Aricia astrarche* var. *calida*, Fiesole, September 4th, 1907; Perugia, September 20th, 1907; Assisi, June 24th to July 10th, but not common. *Agriades coridon*, Iselle, July 10th, 1906; Fiesole, August 27th, 1906, September 7th, etc., 1907, June 21st, etc., 1909; Assisi, July 22nd, etc., 1909; Monte Oliveto, August 20th, very fresh. *A. bellargus*, Fiesole, August 27th, 1906, June 18th, 1909 (just emerging); Assisi, June 28th (fresh) to July 10th (worn out). *Polyommatus escheri*, Fiesole, June 18th and 21st. *P. hylas*, Assisi, July 19th and 22nd, two ♂s only. *P. icarus*, Fiesole, August 27th, 1906, September 4th, 1907; Assisi, September 25th, 1907 (worn), June 24th, etc., 1909, July 31st, etc., fresh brood, very dark, and ab. *celina*: Montefalco, July 3rd; Orvieto, August 9th; Siena, August 14th, and ab. *celina*. *P. meleager*, Assisi, from July 8th onwards (common, but only one ♀). *Hirsutina dolus*, Assisi, from July 23rd onwards, but scarce. *Scolitantides baton*, Fiesole, June 18th, etc., Assisi, from June 28th, to beginning of August, very common. *Plebeius argus* (*aegeon*), Assisi, June 24th and 25th (worn), July 30th, etc. (fresh); Piccione, July 27th; Perugia, August 6th; near Bolsena, August 7th; Orvieto, August 9th; Siena, August 14th and 17th. *P. argyrogynon*, Assisi, July 8th till 24th. *Everes alcetas*, Orvieto, August 9th; Siena, August 17th, etc. *Raywardia telicanus*, Fiesole, September 4th to 9th,

1907; Val d'Ema, September 12th, 1907; Assisi, June 24th, 25th, 29th; Perugia, August 6th. *Celastrina argiolus*, Fiesole, June 21st; Assisi, June 24th, to end of July. *Callophrys rubi*, Assisi, June 26th, one ♂ only. *Bithys quercus*, Assisi, July 9th, one ♀ only. *Nordmannia ilicis*, Florence, June 19th; Assisi, June 28th, July 9th. *Papilio machaon*, Fiesole, August 27th, 1906, September 7th, 1907; Assisi, July 7th, etc., not common except July 9th. *Iphiclides podalirius*, Fiesole, August 27th, 1906; Spello, July 3rd; Assisi, July 3rd, etc. *Parnassius apollo*, Iselle, July 10th, 1908. *Aporia crataegi*, Assisi, July 9th, one ♀ only. *Pieris brassicae*, everywhere, and at all dates. *P. rapae*, ditto. *P. manni* and var. *rossii*, Florence, June 19th; Assisi, from June 25th; Perugia, August 6th; Orvieto, August 9th; Siena, August 17th, 19th. *P. napi*, Tivoli, October 12th, 1907; Val d'Ema, June 19th; Spello, June 29th. *Pontia daplidice*, Fiesole, August 27th, 1906, September 4th, 1907, June 1st, 1909; Perugia, September 20th, 1907; Montefalco, July 3rd; Assisi, September 24th, 1907; from July 17th, 1909; Orvieto, August 9th; Siena, August 14th to 19th; Monte Oliveto, August 20th. *Euchloë cardamines*, Assisi, June 26th, one ♂ only. *Leptosia sinapis*, common till the end of the first week in August. *Colias edusa*, common through summer and autumn, one ab. *helice*, Siena, August 17th. *C. hyale*, from beginning of July through summer and autumn. *Gonepteryx cleopatra*, Fiesole, August 27th, 1906; Rome, October 7th, 1907; Assisi, July 22nd, one ♂ only. *Dryas paphia*, Tivoli, October 12th, 1907 (worn out); Assisi, from July 8th, but not common; Siena, August 17th, one only, worn. *Argynnis adippe*, Iselle, mid-July, 1905, common, mostly *cleodoxa* or *intermedia*; Assisi, July 31st, one ♀ only. *Issoria lathonia*, throughout summer and autumn, but scarce. *Brenthis selene*, Fondo Toce (Pallanza), July 25th, 1906. *B. hecate*, Fiesole, June 18th and 21st, ♂'s only. *Melitaea phoebe*, Iselle, mid-July, 1905; Fiesole, August 27th, 1906; Assisi, from July 29th; Perugia, August 6th. *M. didyma*, Fiesole, August 27th, 1906; Assisi, June 28th, and from July 28th; Perugia, August 6th; Orvieto, August 7th and 10th; Siena, August 17th. *M. parthenie*, Assisi, June 28th to July 5th, and from July 19th (fresh) onwards. *M. athalia*, Caddenabbia, July 27th, 1904 (worn). *Pyrameis cardui*, occasionally, summer and autumn. *P. atlanta*, Assisi, occasionally from June 28th, near Gubbio, July 27th, Bolsena, August 7th, common. *Vanessa io*, Assisi, occasionally from July 9th, near Gubbio, July 27th. *Eugonia polychloros*, Assisi, June 25th and 28th. *Polygonia egea*, Fiesole, August 27th, 1906; Perugia, September 20th and 22nd, 1907; Assisi, Orvieto, Siena, etc., throughout summer, 1909. *P. c-album*, Assisi, July 22nd, one only. *Limenitis camilla*, Assisi, July 2nd (first brood); Florence, September 5th, 1907; Assisi, September 24th and 25th, 1907; Perugia, August 6th; Siena, August 17th (second brood). *Libythea celtis*, Assisi, July 10th, one only. *Pararge moera*, Orvieto, August 7th, one ♂ only; Siena, August 19th, one ♀ only. *P. megaera*, common at all times and places. *P. egeria*, Pallanza (Fondo Toce), July 25th, 1906; Perugia, September 20th, 1907, August 6th, 1909; Tivoli, October 12th, 1907; Orvieto, August 6th; Siena, August 17th. *Satyrus Hermione*, Fiesole, August 27th, 1906; Assisi, from June 28th onwards; Orvieto, August 7th; Siena, August 17th; Monte Oliveto, August 20th. *S. circe*, Fiesole, September 9th, 1907. *S. statilinus*, Fiesole,

September 4th to 9th, 1906, worn ; Monte Oliveto, August 20th. *S. cordula*, Assisi, from June 26th onwards. *Enodia dryas*, Caddenabbia, July 27th, 1903, one ♂ only ; Pallanza (Fondo Toce), July 25th, 1906 (almost of the *sibirica* form, with unicolorous hindwings beneath, ♂'s only). *Hipparchia briseis*, Assisi, from July 22nd. *H. semele*, Assisi, from July 22nd ; Siena, August 17th ; Monte Oliveto, August 20th. *Epinephele jurtina*, everywhere, throughout summer. *E. lycaon*, below Gondo, mid-July, 1905 (very large and dark). *E. tithonus*, Caddenabbia, July 27th, 1906 ; near Orvieto, August 7th and 9th ; Siena, August 14th ; near Monte Oliveto, August 20th. *E. ida*, Fiesole, September 4th and 7th, 1907 (worn out) ; Assisi, from July 14th (first ♀ July 29th) ; Perugia, August 6th ; Orvieto, August 9th ; Monte Oliveto, August 20th. *Aphantopus hyperanthus*, Pallanza (Fondo Toce), July 4th, 1907. *Coenonympha arcania*, Assisi, from June 28th to July 28th (never very fresh). *C. doris*, Assisi from July 5th to 26th. *C. pamphilus*, everywhere, throughout summer and autumn. *Melanargia galatea*, Fiesole, June 18th ; Assisi, from June 24th, throughout July.

Contribution to a list of the Macro-lepidoptera of Bucks.

By (Professor) E. W. CARLIER, M.D., B.Sc.

The following is a list of the Macro-lepidoptera taken by myself in the months of August and September, 1896 to 1900, at Naphill near High Wycombe, in the county of Buckinghamshire. This hunting-ground comprises the extensive common known as Naphill Common towards the south, and as Bradenham Common towards the north, including Bradenham Wood, and extending from Walter's Ash on the east, to Downley on the west, and of the roads and lanes in its immediate neighbourhood, thus occupying the flat top of one of the Chiltern Hills at an elevation of 600 ft. above the sea. The soil, which is chalky, is somewhat unfertile, but oak and beech trees flourish on the Common, with juniper, heather, bracken, various grasses and other chalk soil plants as undergrowth. Several pools, fed entirely by rain, exist among the trees, adding greatly to the sylvan beauty of the place, which, owing to the lack of running water, tends to become rather arid during the height of summer. The insect fauna of the district is rich, if somewhat limited in variety, by the nature of the soil, many varieties of galls being especially numerous upon trees and underbrush alike. The lepidoptera captured are as follows :—

DIURNI.—*Pieris brassicae*, *P. rapae*, *P. napi*, *Colias hyale* (1900), *C. edusa* (1900), *Rumicia phlaeas*, *Polyommatus icarus*, *Aglais urticae*, *Pyrameis atalanta*, *Argynnis adippe*, *Dryas paphia*, *Pararge eyeria*, *Epinephele janira*, *E. tithonus*, *Euodia hyperanthus*, *Coenonympha pamphilus*, *Adopaea flora* (*thaumas*), *Aujiades sylvanus*.

SPHINGIDES.—*Mimas tiliae** (one only), *Theretra porcellus*** (one only), *Sesia stellatarum*.

DREPANULIDES.—*Cilix glaucata*.

NOTODONTIDES.—*Lophopteryx camelina*.

CYMATOPHORIDES.—*Gonophora derasa*, *Asphalia diluta*.

ATTACIDES.—*Saturnia paronia* (larva).

NOLIDES.—*Nola cucullatella*, *Hylophila bicolorana* (one at sugar).

LITHOSIIDES.—*Lithosia complana* (one only).

NOCTUIDES.—*Pharetra megacephala*, *Agrotis segetum*, *A. obelisca*, *Peridroma suffusa*, *P. sancia*, *Lycophotia strigula*, *Noctua glareosa*, *N. baja*, *N. c-nigrum*, *N. ditrapezium*, *Triphaena comes*, *T. pronuba*, *T. fimbria*, *T. ianthina*, *Mamestra brassicae*, *M. pisii*, *M. dentina*, *Luperina cespitis*, *Dryobotodes proteus*, *Diloba caeruleocephala* (larvæ), *Cerigo matura*, *Apamea secalis*, *Miana strigilis*, *M. bicoloria*, *Xylophasia lithoxylea*, *X. monoglypha*, *X. hepatica*, *Polia flaricincta*, *Miselia oxyacanthae* and ab. *capucina*, *Agriopis aprilina*, *Euplexia lucipara*, *Hydroeciia nietitans*, *Leucania pallens*, *L. lithargyria*, *L. conigera*, *Caradrina quadripunctata*, *Amphipyra pyramidea*, *Cosmia trapezina*, *Orthosia macilenta*, *O. helvola*, *Anchocelis lunosa*, *A. lychnidis*, *A. litura*, *Tiliacea aurago* and ab. *fueata*, *Citria lutea*, *C. fulvago*, *Mellinia gilrago*, *M. circellaris*, *Orrhodia racrinii*, *Scopelosoma satellitia*, *Calocampa croava*, *Scoliopteryx libatrix*, *Plusia gamma*, *Catocala nupta*.

GEOMETRIDES.—*Pseudoterpna pruinata*, *Acidalia aversata*, *A. bisetata*, *A. dimidiata*, *A. imitaria*, *Eupithecia absinthiata*, *E. nanata*, *E. sobrinata*, *Numeria pulveraria*,* *Zonosoma (Ephyra) linearia*, *Z. annulata*, *Anaitis plagiata*, *Lobophora viretata* (one only), *Chiematobia brumata*, *Triphosa dubitata*, *Cidaria testata*, *C. pyraliata*, *C. truncata*, *C. immanata*, *C. miata*, *Thera variata*, *Larentia olivata*, *Melanippe sociata*, *M. unangulata*, *Melanthis ocellata*, *Emmelesia alchemillata*, *Hydriomena fureata*, *Eunomia erosaria*, *Selenia bilunaria*, *Boarmia repandata*.

HEPIALIDES.—*Heptalus syrinus*.

Recently described forms of Palæarctic Lepidoptera.

(Continued from p. 261).

By MAX GILLMER.

From the *Internationale Entomologische Zeitschrift* Gubin, iii., 1909, p. 20, *Argynnis maja* var.† *chrysobarylla*, Fruhst.; *Brenthis amathusia* var. *blachieri*, Fruhst.; var. *jugurtha*, Fruhst.; p. 21, *Brenthis dia* ab. *leonina*, Fruhst.; var. *setania*, Fruhst.; *Hipparchia arethusa* ab. *segusiana*, Fruhst.; *H. statilinus* var. *anasarchus*, Fruhst.; ab. *anapus*, Fruhst.; var. *curyana*, Fruhst.; p. 88, *Pieris napi* var. *leorigilda*, Fruhst.; var. *nesis*, Fruhst.; *P. rapae* var. *micipsa*, Fruhst.; var. *lysicles*, Fruhst.; p. 88, *Minois actaea* var. *serra*, Fruhst.; var. *podarcina*, Fruhst.; ab. *castiliana*, Fruhst.; p. 94, *Euranessa antiopa* ab. *asopos*, Fruhst.; ab. *yedanula*, Fruhst.; *Pyrameis atalanta* ab. *rubria*, Fruhst.; *Limenitis camilla* ab. *prodiga*, Fruhst.; var. *glorifica*, Fruhst.; ab. *piellula*, Fruhst.; p. 95, *L. populi* ab. *eumenius*, Fruhst.; p. 112, *Brenthis pales* ab. *brogotarus*, Fruhst.; ab. *palustris*, Fruhst.;

* Species marked with an asterisk were caught by my hostess, and sent on to me afterwards. This list is very incomplete, and has been held back in the expectation that I might revisit the district at some other time of the year, but as that is now unlikely, I have ventured to send it in to the journal in the hope that others may be induced to complete it.—E.W.C.

† Fruhstorfer throughout the following list calls every form of variation a "sub-species," whether it be a "variety," i.e., a local race, an "aberration," i.e., a chance form occurring rarely or commonly with the type, or a seasonal form. It is difficult to know what some of the names mean, and the forms are often quite unworthy of notice. Dr. Rebel speaks about Fruhstorfer's names as "salope (slut) enunciations" (*Verh. z. b. Ges. Wien*, lviii., p. 272). The receipt of a few examples of any butterfly from any district in Europe or elsewhere seems to be sufficient for a name.—ED.

p. 113, *B. euphrosyne* ab. *rusalka*, Fruhst.; var. *densoi*, Fruhst.; *B. daphne* var. *nikator*, Fruhst.; *Heodes virgaureae* ab. *osthelderi*, Fruhst.; p. 120, ab. *alexandrae* (♀), Fruhst.; *Loweia alciphron* ab. *isokrates*, Fruhst.; ab. *romanorum*, Fruhst.; var. *gaudeolus*, Fruhst.; *Chrysophanus hippothoë* ab. *eisalpina*, Fruhst.; *Epinephele lycaon* ab. *salona*, Fruhst.; ab. *nikokles*, Fruhst.; ap. *macrophthalma*, Fruhst.; p. 121, ae. *ephisius*, Fruhst.; *E. jurtina* ab. *phormia*, Fruhst.; *Aphantopus hyperanthus* var. *rufilius*, Fruhst.; p. 130, *Satyrus briseis* ab. *bataia*, Fruhst.; ab. *turatii*, Fruhst.; p. 133, *Pararge maera* ab. *atabyris*, Fruhst.; ab. *ordona*, Fruhst.; ab. *herdonia*, Fruhst.; p. 134, var. *silymbria*, Fruhst.; *P. megaera* var. *depulverata*, Fruhst.; *P. deidamia* ab. *interrupta*, Fruhst.; var. *thyvia*, Fruhst.; *Aranda (Pararge) schrenckii* ab. *menalcas*, Fruhst.; *Erebia adyte* ab. *syrmia*, Fruhst.; ab. *etobyma*, Fruhst.

Myrmecophilous Notes for 1909.

By H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

(Continued from p. 259.)

COLEOPTERA.—ATEMELES PARADOXUS, Gr.—Some six specimens were dug up out of nests of *F. rufibarbis* var. *fusco-rufibarbis* at Whitsand Bay, Rame Head, and Tregantle, in April, by my friend, Mr. Keys, and myself. The beetle was very scarce, and all the specimens were found deep in the nests, very many nests being dug up to obtain these few specimens.

DINARDA PYGMÆA, Wasm.—This species occurred as usual in these nests, and we had a most striking illustration of how this beetle is confined to nests of *F. rufibarbis* var. *fusco-rufibarbis*. All the nests at Whitsand Bay belong to this species, on the other side of Rame Head more nests are true *F. fusca*, and in the Meavy Valley all the nests but one were found to be those of *F. fusca*. In this one nest of *F. rufibarbis* var. *fusco-rufibarbis*, we found *Dinarda pygmaea*, but never in the *F. fusca* nests.

ATEMELES EMARGINATUS was found with *F. fusca* in the latter locality. *F. fusca* is a cowardly and shy ant; when a nest is disturbed they all vanish, this is not the case with *F. var. fusco-rufibarbis*. Mr. Hamm sent me a *F. fusca* nest from Shotover, near Oxford, on July 12th, containing some eggs, ♀s and pupæ. In it I found two larvæ of *Atemeles emarginatus*. These were carried about by the ants, as they did their own pupæ, and fed. On July 15th, one of them was placed on the bunch of eggs. I eventually put them into spirit, as I was using the nest for experiments with *F. sanguinea*, ♀s.

LOMECHUSA STRUMOSA, F.—On May 10th, I noticed a *Lomechusa* in a small nest of *F. sanguinea*, from Woking, laying eggs on the ants' eggs in the nest.

DINARDA DENTATA, Gr.—Occurred as usual with *F. sanguinea* at Woking, and, in plenty, in company with many of its larvæ, with the same ant at Bewdley. I introduced a specimen into a *F. rufibarbis* var. *fusco-rufibarbis* observation nest on July 23rd, it lived in this nest till September 14th, when I removed it and put it into my *F. evecta* nest, where it is still alive, October 29th.

DINARDA HAGENSI, Wasm.—On April 26th, I found specimens of

this beetle in a nest of *F. exsecta* at Parkhurst Forest, Isle of Wight. This is a new locality for it, as the species has only been found at Bournemouth up to now, where I first discovered it in Britain.

OXYPODA RECONDITA, Kr.—Several specimens of this rare species were taken with *F. rufa* at Buddon Wood in May.

OXYPODA VITTATA, MYRMEDONIA FUNESTA, M. COGNATA, and M. LATIOLLIS were found with *L. fuliginosus* at Darenth Wood in June and September; a new locality for all.

MYRMEDONIA LIMBATA, Pk.—A specimen was observed at Bradgate Park, in Leicestershire, on May 3rd, to seize a larva of *Lasius flavus* and drag it out of the nest.

XANTHOLINUS ATRATUS, Gr.—Several specimens occurred with *F. rufa* at Buddon Wood, in May, and one was swept at Tubney, near Oxford, in June.

CLAVIGER TESTACEUS, Preys.—On June 1st, Mr. Forsyth sent me a nest of *Lasius flavus* from Portland, which contained some 50 specimens of *Claviger*. I put two ♀s, and a number of ♀s, egg-masses, and young larvæ into a small plaster nest, with many Clavigers, and frequently saw the Clavigers fed and licked. They ate all the young larvæ and eggs, and also pupæ of other ants I introduced. As many as five or more specimens sat on and crawled about the ♀s, especially on their abdomina, and I believe they ate the eggs as they were laid. Many of the ♀s died, and the Clavigers ate those too. I kept introducing more ♀s and larvæ from the main nest. No Clavigers died, and the ♀s lived till August 30th. I took them to the Isle of Wight, but, unfortunately, on the journey home, all were killed.

MYRMETES PICEUS, Pk.—This species occurred in great numbers in nests of *Formica rufa* at Buddon Wood, in May; I brought a lot home, and introduced them into my different observation-nests. In a nest of *F. rufibarbis* var. *fusco-rufibarbis*, I introduced 12 specimens on May 6th. I had given these ants pupæ of *F. rufa* to eat. The Myrmetes bored into the pupæ and devoured the whole contents. On May 10th, I noticed a pair in cop. The ♂ sits far back on the dorsum of the ♀. A ♀ was observed to lick one of the Myrmetes.

CETONIA FLORICOLA, Hbs.—In May I found a number of the larvæ of this beetle in a nest of *Formica rufa*, at Nethy Bridge. I brought home some 16 specimens in a tin full of the nest materials, on which the larvæ feed. I introduced six specimens into my *F. rufa* observation-nest (these immediately bored into the nest and disappeared), some I preserved in spirit, and the rest I left in the tin. The larva does not use the legs for walking. When placed on a table, or on the floor, it turns over on its back, and moves rapidly along by means of the bristles on the back, the legs being held up in the air. The larvæ in the tin made their pupa-cases from the nest materials and pupated at the end of July, and hatched out in August. I have them alive now. Those in my nest hatched out and came up in August.

DIPTERA.—PHYLLOMYZA FORMICÆ, Collin.—I bred this species this year from larvae which I found in some numbers in a nest of *Formica rufa-pratensis*, at Nethy Bridge, in May. The larvae occurred in the chambers of the ants at the bottom of the nest. This proves that the species is not parasitic on the ants, but lives free in the nests. I put

a number of the larvae in a tin, with mould from the bottom of the nest, and they changed to pupae and hatched out in June.

PHYLLOMYZA sp.?—I took a number of a species with *Lasius fuliginosus*, at Darenth Wood, in July and September. Mr. Collin tells me this is the same species I took with *L. fuliginosus* on the Birkdale sand-hills, and is distinct from *P. lastiae*, Collin, which I have taken with the same ant at Oxshott, and have bred out of my observation-nest of that ant from Wellington College.

MILICHIA LUDENS, Wahl.—This fly, which is new to Britain, I took in a nest of *Lasius fuliginosus*, at Darenth Wood, on June 6th. Collin has kindly supplied me with the following information about it. It was described by Wahlberg in 1817, as *Lobioptera ludens* (*Ofversigt Kongl. Vetensk. Akad.*, iv., p. 261, pl. vii., fig. 1). In 1873, Raddatz (*Archiv Vereins der Naturgesch. in Mecklenburg*, xxvii., p. 102) records that it lives with *Lasius fuliginosus*, and that he had taken it with that ant in May and June.

CERATOPOGON MYRMECOPHILUS, Egger.—Collin and I caught several ♂s flying over a nest of *Formica rufa*, at Weybridge, on July 5th, and I netted others over a nest of the same ant at Darenth Wood, on September 24th.

LIMOSINA CURTIVENTRIS, Stnh.—This species was again found with *Lasius fuliginosus*, this time at Darenth Wood, in September.

LIMOSINA sp.?—A ♂ and ♀ taken with *L. fuliginosus*, at Darenth Wood, September 26th. Collin writes of them, "A most interesting little *Limosina*, new to me; unfortunately the male is headless, but the abdomen is so remarkable I think it might safely be described." I unfortunately broke the ♂ when pinning it.

PHORA FORMICARUM, Verrall.—I have at last succeeded in taking this little species. I found it rather commonly at Bewdley Forest, in July, with *Lasius niger*, *L. flavus* and *Formica sanguinea*. The little fly hovers over the ants, flying very steadily, and getting nearer and nearer to an ant, which it strikes at. I found they would strike at ants on my hands, when I kept quite still. It was amusing to watch an ant which had become aware of the presence of the fly, make a dash for safety pursued by the fly. I subsequently took it over a *L. niger* nest, at St. Helens, in the Isle of Wight, in August. I have also seen it hovering over *L. fuliginosus* at Wellington College and Darenth Wood.

PHORA AEQUALIS, Wood.—Taken in some numbers in a nest of *Lasius fuliginosus* at Darenth Wood, on September 24th.

PHORA sp.?—I twice captured a very small *Phora*, with long posterior legs, in the same nest as the last species. Collin writes, "Dr. Wood does not recognise it, he says it is remarkable in having a very long costa and long costal fringe."

TRINEURA ATERIMA, F.—♂ and ♀ taken with *L. fuliginosus*, Darenth Wood, June 6th.

MICRODON DEVIUS, L.—I netted a specimen of this beautiful fly at Cothill, near Oxford, on June 30th. The larvae should be searched for in nests of *Formica fusca*, etc.

ARANEINA.—*THYREOSTHENIUS BIOVATA*, Camb.—This species was found in *F. rufa* nests at Parkhurst Forest, Isle of Wight, in April, Buddon Wood, Leicestershire, and Nethy Bridge, Inverness-shire, and in plenty, ♂s and ♀s, and very young, with *F. rufa-pratensis*, at

Nethy Bridge, in May. A young ♂ was taken with *F. fusca* at Aviemore, on May 17th. This is the first time I have found it with this ant.

EVANSIA MERENS, Camb.—I took ♂s and ♀s with *F. fusca*, and ♀s with *F. sanguinea*, at Aviemore, on May 17th.

SALTICUS FORMICARIUS, De Geer.—I took this rare species again this year in the Isle of Wight, this time at Luccombe Chine, a young ♂ being captured in company with *Myrmica scabrinodis*, on August 29th.

CICURINA CINEREA, Panz.—I found a number of ♀s, young and adult, in a nest of *Lasius fuliginosus*, in October. My friend, Mr. Cambridge, writes, "I have only met with this here in old disused drains The shelter and accommodation afforded by ants' nests would probably be very congenial to this species."

DYSDERA CAMBRIDGII, Thor.—I took specimens of this spider with *F. rufibarbis* var. *fusco-rufibarbis* at Whitsand Bay, in April, and with *F. sanguinea* at Woking, in May. Van Hasselt recorded it with *Lasius brunneus*.

CRYPTOCECA RECISA, Camb.—Two ♀s were taken in nests of *F. fusca* at Bradgate Park, in Leicestershire, in May. Mr. Cambridge writes, "This is only the second record of the species, the former having occurred in Sherwood Forest several years ago, swept, I believe, from heather. The ♂ is unknown."

MICARISOMA FESTIVA, C.K.—This species was taken in April, with *L. niger*, at Whitsand Bay and Rame Head, and with *L. flavus* at Virtuous Lady Mine.

MICARIA PULICARIA, Sund.—This spider occurred with *L. niger* at Virtuous Lady Mine, and with *Tetramorium caespitum* at Whitsand Bay, in April, and in May with *Formica exsecta*, at Aviemore.

PROCTOTRUPIDÆ.—*TROPIDOPRIA FULIGINOSA*, Wasm., was found in nests of *F. rufa* at Buddon Wood, in Leicestershire, in May, and a var., with the same ant, at Nethy Bridge, on May 18th.

COMOSTIGMUS TESTACIPES, Kief.—This species, which is new to Britain, was taken in a nest of *Formica rufa* at Nethy Bridge, on May 18th.

LAGYNODES PALLIDUS, F.—Two specimens occurred in a nest of *F. fusca*, in Parkhurst Forest, Isle of Wight, in April. When this species meets an ant it tucks in its antennæ and feigns death.

TETRAMOPRIA DONISTHORPEI, Kief., and *T. FEMORALIS*, Kief.—Both these species, which are new to science, were discovered by me in nests of *Tetramorium caespitum* at Whitsand Bay, in April. In this genus, which was erected by Wasmann, the hairs on the neck, which are usually white in other *Proctotrupidae*, are golden, and are licked by the hosts. They are on good terms with their hosts, and, I observed, when they met that they tapped antennæ with the ants. They are parasitic on the larvæ of the ants.

PLANOPRIA PEDESTRIS, Kieffer.—A genus and species new to science. I took several of this little creature running about in company with *Lasius niger* at Luccombe Chine, in August. They are apterous, and were rather ant-like in appearance when alive.

LOXOTROPA n. sp.?—Taken with *Lasius fuliginosus* at Darenth Wood, on September 29th. Dr. Kieffer writes that he will send on name

later. *Loxotropa tritoma*, Thoms., is recorded in the nest of *Tetramorium caespitum*, "Vic. Hist. Devon," 1906, p. 187.

GONOTOPUS DISTINCTUS, Kief.—I swept a specimen in company with *Myrmica laevinodis*, in the New Forest, on June 18th.

(To be concluded.)

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

NOTES ON THE LARVAL HABITS OF *DRYAS PAPHIA* VAR. *VALESINA*.—In July, 1908, I obtained ova from a New Forest ♀ (♂ unknown) deposited on moss; the ♀s never deposit on their food-plant. These hatched in fourteen days, and, after eating their egg-shells, went at once into hibernation on moss, no food being supplied to them. On March 21st, 1909, I sprayed the moss with lukewarm water and placed same in the sunshine; within a couple of hours the larvæ started to move, and within three days some 80 made their appearance. These were removed to young leaves of *Viola canina*: after retiring to the underside of the leaves, and remaining dormant for six days, they started feeding vigorously, early morning and late afternoon being their favourite hours; they are also fond of the early morning sunshine. The dates for the moults were April 10th, 19th, 28th, and May 8th, pupating from May 23rd, onwards. The 77 imagines produced were:—41 typical males, 28 typical females, 13 var. *valesina*.—E. C. Joy, 2, St. Kilda's Road, Stoke Newington, N. October 18th, 1909.

NOTE ON THE LARVAL HABITS OF *BRENTHIS EUPHROSyne*.—Ova obtained from a Lincoln ♀, captured in June, 1908; these hatched in twelve days, and were placed on growing plants of *Viola canina*; after moulting twice, they settled down for hibernation, in early August. On March 21st, 1909, only 15 out of 80 larvæ had survived the winter, these appeared weak and sickly, and here the great difficulty with the larvæ arose; they refused their food; they would only wander round, basking in the sunshine; apparently they lacked strength to accomplish their moult. On April 3rd only four safely survived the moult, and these started feeding ravenously, their movements being exceedingly rapid. Except whilst feeding, they never rest on their food, retiring amongst the moss, but always in the sunshine. These moulted again on April 11th; the first, pupating on April 19th, produced an imago on May 21st.—Id.

DESCRIPTION OF EGGS OF LEPIDOPTERA.—*Metrocampa margaritaria*.—Eggs laid by a ♀ captured near Meran at the entrance of the Passier-Thal, August 10th, 1909. The eggs are laid in regular rows in clusters of 50-150. They are of typical Geometrid shape, but turned up on end, so that the rounded micropylar end is at the top of the egg. The eggs are pale green in colour when first laid, quite uniform and homogeneous, but turn to a pinky colour, speckled all over irregularly with various-sized blood-red dots. The micropylar area is freest from these dots, except that one or two quite large dots are usually conspicuous in the position of the micropyle. The eggshell appears to be quite smooth under a hand lens. The peculiarity of these eggs is in their being laid as upright eggs (Described August 17th, 1909, under a hand lens).

Thalera imbrialis.—♀ captured August 7th, 1909, in the Sarnthal; 6 eggs laid in a box, 2 close together almost

touching on the lid, 2 a good distance apart, and 2 touching each other on the bottom of the box; of these last, one is laid normally flat, the other is laid against it somewhat on edge. The egg is moderately bright yellowish-green in colour, oval in outline, depressed considerably over the greater part of the upper surface. With a hand-lens the shell appears to be uniformly minutely pitted. The contents appear to be pale, and one traces without difficulty the embryo larva inside, lying around the outer edge of the egg, the central depression apparently almost meeting the base. On August 23rd, 4 eggs empty—larvae dead—eggs transparent; a cleanly-bitten circular hole at the micropylar end of each egg. August 25th—the other two just hatched, and the lovely little yellow larvae put on knot-grass, and sent to the Rev. C. R. N. Burrows.

Colias phicomone.—2 ♀s, caught on the Stelvio, August 15th, 1909, laid a single egg each on a hindwing. Pale yellow when laid, but had changed by August 17th, to a deep orange-red, except the extreme base and apex, which remained yellow. The egg is tall, spindle-shaped, much thicker in the median part than at either end, ending in rounded point at apex; delicately ribbed longitudinally with fine shiny ribs, reaching from apex to base, and very finely ribbed transversely between the longitudinal ribs; the general appearance both in colour and ribbing, to a cob of Indian corn, is very striking. The longitudinal ribs appear to be 14 (but this number may not be quite accurate, as we have only a hand-lens for the examination of the eggs). The egg appears to be about three times as high as is its width, at the widest part. One of these eggs hatched August 23rd, the egg-shell being absolutely transparent after the larva had left it. The larva was put on a clover leaf and next morning was seen to have nibbled a little hole in it.—J. W. TUTT.

NOTES ON COLLECTING, Etc.

LEPIDOPTEROUS LARVAE.—It may not be inadvisable to note that the following larvae have been taken in our locality this season, viz., *Amorpha populi*, *Smerinthus ocellatus*, *Lasiochampa quercus*, *Macrothylacia rubi*, *Drepana falcataria*, *Clostera reclusa*, *Notodonta dromedarius*, *N. ziczac*, *Lophopteryx camelina*, *Cerura furens*, *Apatela aceris*, *Plusia moneta* (taken on monkshood), *Amphidiasys strataria*, and *A. betularia* (in large numbers on horse-chestnut). I may add that large areas of cabbage-plants have been destroyed by the larvae of *Pieris brassicae* and *P. rapae*.—G. HOBBS, 37, Alexandra Road, Aldershot, Hants. November 4th, 1909.

LEPIDOPTERA IN ESSEX IN 1909.—I have observed the following not generally common lepidoptera in this county during the past season:—*Eupithecia exiguata*, *Macaria liturata*, and *Tephrosia luridata*, June 6th, on rushes and fences near Childderditch Common; *Tinea semifulrella*, June 13th, near Thorndon Park; *Bactra furfurana*, July 3rd, flying freely in the evening over Bowers Gifford Marsh; *Argyresthia curvella*, July 8th, on a fence in Southend; *Phragmatobia fuliginosa*, August 11th, at electric light, Westcliff; *Doryphora palustris*, August 14th, *Achroea grisella*, August 15th, *Nonagria arundinis*, August 16th, at electric light, Westcliff; *Eupocelia affinitana*, August 26th, on a poplar trunk in Southend, no doubt a traveller from the marshes; *Parapolyx stratiotata*, ♀, August 27th, at the electric light,

Westcliff; *Notodonta dromedarius*, August 29th, two full-fed larvae on alder at Coombe Wood, Thundersley; *Stigmonota weirana*, September 26th, larvae between beech-leaves near Thorndon Park; *Eurymene dolabraria*, October 10th, a larva on Scots-fir trunk near Thorndon Park.—F. G. WHITTLE, 7, Marine Avenue, Southend. November 3rd, 1909.

SCOPARIA LINEOLEA AT LULWORTH.—Wishing to see *Thymelicus acteon* at home, I travelled down to West Lulworth, on July 29th, but the day was unfavourable and no butterflies were about. I, of course, had the pleasure of seeing the Cove, which was alone worth the journey. I got *Scoparia lineolea*, and one or two other things, but no *T. acteon*.—ID.

LAPHYGM EXIGUA IN CORNWALL.—On the evening of September 20th, I had the pleasure of capturing a female specimen of the above species, in fine condition at sugar, in my garden.—A. T. SPILLER, Godolphin Cross, Helston. October 30th, 1909.

CAPTURES AT IVY BLOOM.—Ivy is a very prolific plant in this neighbourhood, but the continuous wet weather during October, interfered greatly with the proper “working” of it. Possibly *Xylina socia* (*petrifieata*) is the best insect taken at ivy here. It comes likewise to “sugar,” and I have taken it in my own garden both at sugar and ivy bloom. Although it occurs very sparingly over a considerable tract of country, I have never been able to find it in plenty anywhere. On October 19th, accompanied by a non-entomological friend, I visited a famous locality a few miles away. It consisted of a park wall nearly five miles in circuit, and almost the whole distance covered with ivy. But after beating for a distance of about two miles, I found my captures of *X. socia* had amounted to four only. There is great variation in a long series of this moth; they vary from very pallid to dark, in fact I have one specimen so dark that I at first thought I had *X. semibrunnea*. *X. socia* is sure to be in good condition at ivy bloom, presenting a great contrast with *Epunda nigra*, of which species not more than 50 per cent. can be considered as cabinet specimens. This species is much commoner than *X. socia*, as I have taken from 15 to 20 specimens of an evening. Occurring with *E. nigra* is *E. lichenea*, although not in such plenty. *Peridroma (Agrotis) saucia* is also not uncommon in early October. September is possibly the best time for this species, as I take it then at sugar. It occurs here every year, and in all the well-known varieties. *Peridroma (Agrotis) suffusa* is not so plentiful as the last species; it occurs in October and November, and I took in 1907 an extraordinary melanic specimen. Other species that occur at ivy, are *Noctua glareosa*, including the suffused form, *Agrotis segetum*, commonly, *Caradrina quadripunctata*, of which common species I secured a specimen with the forewings quite black, *Noctua c-nigrum* and *N. pleeta*, commonly, *Hydroecia micacea*, *Citria cerayo*, *C. silago*, *Polia floricineta*, *Xylina rhizolitha*, scarce, *Ancochelis rufina*, *A. pistacina* and *A. lunosa*, in many varieties, *Cerastis vaccinii*, *C. spadicea*, *Orthosia lota* and *O. macilenta*, commonly. One well-known species, *Scopelosoma satellitia*, does not seem to occur at all, for I have been looking for it for four seasons without success.—A. J. SPILLER, Godolphin Cross, Helston. October 30th, 1909.

ARGYNnis NITOCHRIS VAR. NIGROCÆRULEA AB. RUFESCENS.—An apparent ambiguity occurs in *Ent. Rec.*, p. 186, with regard to ab. *rufescens*. It

is, of course, an aberration of *Argynnis nitocris*, i.e., *Argynnis nitocris* var. *nigrocaerulea* ab. *rufescens*.—THEO. D. A. COCKERELL, Boulder, Colorado. November 3rd, 1909.

FURTHER NOTE ON *SERICORIS MICANA*, FRÖL.—In answer to my note (*antea* pp. 236-237) criticising his statement [*Ent. Rec.*, xix., 273 (1907)] that the females of *Sericoris micana* "are much larger than the males," Mr. George Wilkinson has now kindly written to tell me that he is unable to send me any individuals of this species for examination, being separated from his collection, which is in the public museum at Carlisle, but that he will be pleased to supply me with some in the course of next season. Fortunately, however, we need not wait till then for a solution of the mystery, for, in the course of his communication, Mr. Wilkinson writes as follows:—"I have no doubt my words ought to have been 'the females are much smaller than the males.' Barrett is quite right when he says the females are smaller and more bright. I sent him ten of each sex" This last fact makes it highly probable that Barrett's statement about the sexual differences, to which I drew attention (*loc. cit.*) as endorsing my own observations, was based largely, is not entirely, on specimens taken by Mr. Wilkinson.—EUSTACE R. BANKES, Norden, Corfe Castle. November 19th, 1909.

Sale of the first part of the late J. A. Clark's collection of Lepidoptera.

The first part of the collection formed by the late J. A. Clark was sold at Stevens' sale-rooms on November 2nd and 3rd, 1909. Although the two days' sale produced roughly some £350, the prices of most of the insects ruled low. But there were some "lots" that produced high figures, and that largely helped to swell the total. Among the butterflies, one dark *Pieris napi* from Londonderry produced £1 12s. 6d., *Pontia daplidice* ♂ and ♀ by Lepelley, Dover, 1867, only 5s., whilst one June, 1882 (S. Hart), and another from Machin's collection, brought £1 2s. 6d., two reputed Dover ones (Miller) 7s., and one reputed Southend example 6s. A curious gynandromorphic *Euchloë cardamines* from the "Mason coll." was sold for 18s., and two other interesting aberrations 16s.; two buff forms of *C. edusa*, 11s., and two lemon-coloured ones 10s.; a heavily-dusted dark ♂ *Dryas paphia*, 9s., and a fine gynandromorph, left side ♂ and right ♀, £2 4s., whilst an intermediate form between typical *paphia* and *valesina*, went for 12s. A very fine *Argynnis aglaja* (figured *Ent. Rec.*) produced £5 5s., and £7 10s. was obtained for a ♀ taken at Abbott's Wood, 1887. *Issoria lathonia* (Harper) produced 10s.; one reputed Dover example (Lepelley), and another from the "Bouchard coll.," produced 10s. the two, whilst two others labelled as taken by the Rev. T. H. Marsh, of Norwich, 17s. [These captures appear to have been made by the gentleman who is reported to have taken *Syrichthus alveus* in Norfolk (*Ent. Mo. May.*, xxviii., p. 244), in whose collection St. John found two *Everes argiades* taken in Somerset (*Proc. Ent. Soc. Lond.*, 1891, p. xxxi), by whom three *Vanessa antiopa* of the "Burney collection" had been taken (*Ent. Rec.*, v., p. 40), etc.]; another from Bournemouth (1872, Smith) for 7s.; a fine aberration of *Brenthis selene* produced £2 2s., one of *Melitaea athalia*, £1 6s., two others £1 6s., and another from

Abbots Wood £6. A fine suffused *Aglais urticae* produced £1 5s., and another £1 15s., whilst reputed British *Euvanessa antiopa* went at 10s., 15s., 6s., 5s., 6s. (2), 8s., and £1 6s. apiece: two nice *Pyrameis cardui* produced 18s., and another (Ent., xiii., p. 73) £12 12s., and yet another (Ent., vi., p. 345) 10 guineas. Aberrations of *Limenitis sibylla* went for £1 12s. 6d., 11s., and 8s. each, whilst a dark suffused ♂ *Pararge megaera* brought 18s. Aberrations of *Epinephele ianira* £1 10s. and £1 1s. (Newman's Butts., p. 92); *Chrysophanus dispar* went at, ♂ £4, ♂ £7 10s., ♂ £3, ♂ £1 5s., ♀ £4 4s., ♀ £6 10s., ♀ £4, ♀ £3 3s. ♂ underside £2 12s. 6d.; a dark brown ab. of *Rumicia phlaeas* produced £1 14s., another £5 10s., another £1 12s. 6d., another 18s., and a set of six others £1 17s. 6d., whilst a gynandromorph *Plebeius aegon* (Nat. Hist. Brit. Butts., iii.,) produced £1 1s., and a gynandromorphic *Polyommatus icarus*, right side ♂, left side ♀, 13s., another left side ♂ right ♀ (Eltham, July 10th, 1894) 11s.; a leaden-coloured *Agriades thetis (bellargus)* (Ent. Rec., iv., 259) produced £4 6s., and a good *A. coridon* ab. *semisyngrapha* £1 1s.; *Cyaniris semiargus* produced 6s., 9s., 8s., 14s. per pair, 12s. (3), 11s. (2 ♂s), and 11s. (3 ♂s). A gynandromorph of *Celastrina argiolus*, right side ♂, left side ♀ (Nat. Hist. Brit. Butts., ii.,) produced £5 5s., and a little lot of *Hesperia malvae* ab. *taras* 9s. So much for the butterflies.

The Sphingids fetched fair prices, although it is evident that this part of the collection did not contain the beautiful Smerinthid aberrations we know Mr. Clark possessed. A specimen of *Hyles euphorbiae* (with a history dating from 1844), only produced 6s.; one *Phryxus livornica* (Kingsland) 16s., another (Bevendean) 24s.; *Hippotion celerio* (Hastings) 12s., another (Portslade) 26s., yet another (Walthamstow) 12s.; an aberration of *Eumorpha elpenor* (Tottenham) £1, whilst the *Ægeriids* fetched 10s., 9s., 14s., 12s., 8s., and 8s. per lot. The historical "Romney Marsh," *T. respiformis*, taken by "the mythical Mr. Wigan," produced 7s. each, whilst three aberrations of *Anthrocera trifolii* (one ab. *lutescens*) produced 9s., two of *A. filipendulae* 10s. The Nolids appear to be valuable now, sets of six *Nola centonalis* and six *N. albulaalis* going for 25s., 24s., 28s. a time, whilst a white ab. of *N. albulaalis* produced 19s., and an example of *Setina irrorella* ab. *signata* £1; a remarkable *Enistis quadra* fetched 14s., and *Deiopeia pulchella* (Ringmer) 10s., (Dover) 27s., (Dover) 28s., and others 6s., 7s., 5s., 4s., whilst an *Euchelia jacobaeae*, with the crimson replaced by greyish-black, produced 24s. The "lots" of *Arctia caia* in order from lot 194 onwards, produced 6s. one specimen (194), 18s. one specimen (195), 5s. (196), 6s. (197), 4s. (198), 4s. (199), £8 8s. one specimen (200), 22s. one specimen (201), £6 three specimens (202), 8s. (203), 13s. (204), £1 8s. two specimens (205), 7s. (206), £3 10s. four specimens (207, 208), £2 2s. three specimens (209, 210), 3s. (211), £1 (212), 22s. two specimens (213), 4s. (214), 16s. two specimens (215), 7s. (216), £3 7s. 6d. one specimen (217), 4s. (218), 4s. (219), £9 one specimen (220), £1 12s. 6d. (221), 3s. (222), £5 10s. two specimens (223), 28s. one specimen (224), 4s. (225), 16s. (226), 6s. (227), 10s. (228), 16s. (229), 3s. (230), 3s. (231), 3s. (232), 7s. (233), 14s. two specimens (234), 18s. two specimens (235), 7s. (236, 237), 10s. (238), £3 two specimens (239), 4s. (240), 7s. (241-244). With the exception of the last combination, none of the lots

contained more than seven specimens, the average about three or four.

The other Arctiids and Lymantriids produced on the whole very fair prices, the Lachneids, Notodontids, and Drepanulids, in the case of varieties, fairly high ones. An aberration of *Arctia villica* £2 5s.; series of moderate Spilosomas, 25s., whilst *Laelia coenosa* went at 21s., 35s. 30s. per pair, although two ♀s only fetched 9s.; *Gastropacha ilicifolia* produced 20s., 11s., 8s., 7s., 9s., 8s., 24s. each, whilst a magnificent brown-black ♀ *Saturnia paronia* produced £15; and pairs of *Drepana harpagula* 7s., 9s., 11s., and 11s.; *Cerura bicuspis*, in threes producing 6s. on three occasions, but a fine black *Cerura vinula* went up to £7 15s.; a *Microdonta bicolor* of "Bouchard," produced 17s., others 10s. and 6s., with other insects; a fine light *Asphalia ridens* fetched £1.

The Noctuids and Geometrids, on the whole, produced low prices, *Bryophila impar*, 9s. for five, on two occasions, *Hyboma strigosa*, 10s. for seven (twice), a *Leucania extranea* (Ent., xii., p. 19) only 7s., and *Nonagria sparganii* and *Leucania albipuncta*, less than 8d. apiece; "Brighton" *Synia musculosa* at 4s., and "Canterbury" *Leucania l-album*, 4s., with many other specimens, were not excessive prices for those who want such rarities; whilst 14s. for five *Xylomiges conspivillaris* cannot be considered dear; £2 was reached for two dark *Crymodes erulis*, £1 8s. for three light ones, and £2 2s. for three more; *Hydrilla palustris*, from Wicken, £1 8s. and £1 each, whilst a curious *Agrotis exclamationis* raised lot 306 to 2 guineas; a fine example of *Triphaena jimbria* produced £4 4s., and ♂ *Agrotis subrosea* £2, £1 15s., and £1 10s., and ♀s, £2 15s. apiece, ♂ and ♀, 10s. 6d., and ♂ and two ♀s 24s., according to condition; one little set of *Pachnobia hyperborea* var. *alpina* produced £1 17s. 6d., whilst six successive *Cerastis erythrocephala* produced 6s., 4s., 45s., 5s., 7s., and 7s. respectively, the 45s. "lot" being from "J. H. A. Jenner, Lewes." Three *Luperina barrettii* went for £1 1s., and one *L. barrettii* and one var. *wicklini* for 18s., and a similar lot for 14s.; *Xylina zinckenii* (of which a lot more than have ever been caught in England seem to be in the market) went for 21s., 21s., 24s., and 18s. per specimen, and three lots consisting of one *Xylina conformis*, and two *Cucullia gnaphalii*, went for 10s., 13s., and 14s. respectively; a *Catocala fraxini* (1840), 7s., another (captured by a Mr. Lepelley, also responsible in other parts of the catalogue for *P. daplidice* and *I. lathonia*) 10s., another (Regent's Park) 6s. A fine ab. of *Rumia crataegata* (also taken by Lepelley), produced 21s.; another by the same 15s., whilst an ab. of *Venilia maculata* went for £4 4s., another for £4; *Nyssia lapponaria*, bred, have sunk to 1s. each, but the extinct *Cleora riduaria* produced 30s., 22s., 16s., 10s., 12s., 14s., 15s., 20s., 14s., 13s. each, and *Boletobia fuliginaria*, 42s., 42s., 42s., and 18s. each. The two days' sale produced roughly £350.

CURRENT NOTES.

The resignation of Mr. Guy Marshall as a member of the Council of the Entomological Society of London, has been received with very great regret, and Mr. G. T. Bethune-Baker has been elected on the Council in his place. A second vacancy on the Council due to the resignation of Mr. R. Shelford, through ill-health, has been filled by

the appointment of Dr. Malcolm Burr, who also takes Mr. Shelford's place on the "Business and Publication Committee."

It would appear that the Business and Publication Committee of the Entomological Society of London will this year bring the publication of the *Transactions* up-to-date. As well as Parts iii, iv and v of last year, Parts i, ii, and iii, of the current year have already been published since January, and, if fairly fortunate, Part iv will be out shortly, so that the Fellows should be in the happy position at Christmas of awaiting Part v—the Presidential Address—which might be published almost as soon as it is delivered.

An unambitious little volume, "The scaly-winged," by R. B. Henderson, M.A., comes under notice. There are, in this booklet, some rather startling statements, and, as it is written as a very elementary text-book, on a knowledge of which the boys of Rugby School are to be admitted, after examination, to the entomological section of the School Natural History Society, one would have expected it to have been accurate as far as it goes, and so, on the whole it is, and, as it is charmingly written, its errors and blunders read almost like truth, even when one discovers them. One only hopes that the youngsters who have read ahead of the master's text-book, will not be ploughed for writing the true facts, which the master has evidently not observed. One suspects, too, that any of the youngsters who may have seen the eggs of *Pararge egeria* and *Epinephele ianira*, etc., will not be satisfied with the sketches on p. 15 (after Furneaux).

We are inclined to ask Mr. Henderson whether he has ever personally confirmed the statement that "nearly all that part of a caterpillar's body which is not used for digestive purposes, is occupied by silk-making apparatus," and particularly, where the "circulatory system" and "fat body," come in? We would also ask Mr. Henderson what he thinks, on mature consideration, of his remarkable little statement on "Melanism?" Mr. Henderson's complete remark on the subject reads:—

"It is worthy of remark here, that the colouring of species of lepidoptera exhibit a distinct tendency to become darker with increased distance from the tropical and subtropical regions. This is, perhaps, due to the greater prevalence of dark tree-trunks and undergrowth in the more northerly districts, giving in consequence better protection to the darker individuals of a species. This phenomenon is known as Melanism."

We suppose this must be so, if our author says so, but we hope the boys will neither be misled by the definition or assumed facts. The remarks on the selection of a partner by the ♀ lepidopteron, are written with such a charming ease and insouciance, that one is apt to think they also must be true, but, unless our field observations are greatly at fault, the principal statement is entirely wrong. We should like to challenge Mr. Henderson to cite a single case that has come under his *own observation*, in which the ♀ has certainly selected from several (two or more) the ♂ that she wishes to pair with her. We have made dozens of observations that certainly go to prove that the ♀ is hopelessly and entirely passive and indifferent, and that the quickest, most active ♂, is the one that pairs. When a ♀ refuses a ♂ it is usually because she has already been fertilised and no longer requires his services.

One other thing strikes us, why should the Rugby boys be confined to questions on butterflies and moths for admission into the School Natural History Society. Equally elementary notes relating to the

other orders, are surely more important; already the lepidopterists outnumber the students of all other orders, and not one out of a hundred of those who commence collecting lepidoptera ever become really scientific collectors; on the other hand, in the other orders, with so much more unoccupied ground, a larger proportion of those who do once start collecting pursue their studies to some definite conclusion, but the actual number who commence collecting these orders is small. It may be said that the difficulties of dealing with this wider subject simply, and in a reasonable-sized booklet, would be too great, but we have also lying on our table, another volume—

“Directions for collecting and preserving insects,” by Nathan Banks, published by the Smithsonian Institution, and which, reduced to the simple form that Mr. Henderson uses so effectively, and illustrated by British species, would do admirably for the purpose. Mr. Banks’ book is elementary but accurate, written by an entomologist for young and budding entomologists, and as one reads on, one does so with the knowledge that every word that is printed is that of one who knows, and that the book is written because the writer has really got something to say, and not really that he must write even if he has nothing to write about. But, in England, Mr. Banks would have to go to the public with his work, and being accurate, and not, in the generally accepted sense of the present superficially-educated age, popular, one suspects he would not be able to find a publisher to publish his book. It is, however, exactly the sort of book that the intelligent Rugby boys want.

It is nice amongst so much poor entomological literature submitted to us recently, to find such a piece of excellent grind as *A descriptive catalogue of the Dobrée collection of European Noctuae*, by Horace B. Browne, M.A., and published for the Hull Museums’ Committee by A. Brown and Sons, Ltd., Hull, London, and York, at the price of 1s. The work is thorough from beginning to end, and reflects great credit on the author, who, with such a training as the preparation of this *Catalogue* has necessitated, must now be one of the best informed entomologists in this country, at least so far as the European Noctuids are concerned. We heartily recommend everyone interested in our British Noctuidæ, which, after all, form a large part of the collection, to purchase this *Catalogue*, which is not only a *Catalogue*, but an exceedingly full and informative text-book on the variation of the superfamily. During a recent visit to Hull, we ourselves had the pleasure of examining the Dobrée collection, and can bear personal witness to the care bestowed on it by Messrs. Shepherd, Stainforth, and H. B. Browne. Its position so near the door and an outside wall, is the only doubtful element.

Entomology was not altogether absent from the recent Annual Exhibition of the Royal Photographic Society. Among others was some excellent work by Messrs. A. E. Tonge (*Bryophila muralis* and eggs of lepidoptera), and Hugh Main (*Syrphus balteatus*), whilst Mr. P. J. Barraud showed some promising work (*Urbicola comma*). Dr. Duncanson’s work (metamorphosis of dragonfly) is wanting in detail, and Mr. Douglas English’s entomological work falls below that to which Messrs. Tonge and Main have accustomed us; it is somewhat stilted, the insects are not of natural size, and altogether very unsatisfying, nor does it compare at all favourably with his treatment of

mammals, in which he gains a distinctly greater measure of success. Mr. A. W. Dennis exhibits some first class geological photographs of the Pass of Llanberis and its vicinity.

The completion of vol. iii. of *A Natural History of the British Butterflies* (*A Nat. Hist. Brit. Lep.*, vol. x.) leads us to ask for further help in various directions. We have in this issue published no fewer than 53 full-size plates illustrating the life-histories, variation, and biological details of the species treated. Although the photographs have been kindly given us by Dr. T. A. Chapman, Messrs. Main, Tonge, and other friends, the cost of reproduction and printing so many illustrations adds a great expense to the volume. We are anxious, therefore, to enrol as many subscribers as possible for this and the new volume, which will be at least as fully illustrated. The volumes, published in monthly parts at 1s., less than the cost of a halfpenny daily newspaper, should fall well within the means of every lepidopterist, and everyone who can afford to support the work in this way, is helping to ensure its continuance. The steady increase of illustrations in the last four vols. published, they have been 5, 20, 28 and 53 respectively, will give a good idea of the development in this direction.

Another matter we should like to note. Many of our friends send us photographs, etc., after we have completed our survey of the species. We have received many photographs of aberrations of *Plebeius argus* (*aegeon*) and *Agriades thetis* (*bellargus*) since our surveys of these species have been completed, and when, of course, the plates have been made up, and it is too late to use them. We are now at work on *Agriades coridon*, *Polyommatus icarus*, *Aricia astrache*, *Lycaena arion*, and *Hamearis lucina*. Pictures and photographs of good aberrations of these would be very welcome before we make up our plates on the known forms of the species, and photography is now such a common acquisition among entomologists that one might reasonably expect more help in this direction. All figures, however, should be of natural size, and the figures clearly defined. Good sharp pencil drawings reproduce exceedingly well.

There are two or three things that we want to beg from our British collectors: (1) A few representative examples of the various forms of *Aricia astrache* captured in Durham, Northumberland, Cumberland and Westmorland, or any outlying district of Wales or the south-west of England; (2) a few midland, western and northern examples of *Agriades coridon*; (3) a typical ♂ and ♀ of *Lycaena arion* from Devon, Gloucester, and Cornwall. The specimens are wanted for dissection if need be, and so cannot be returned. If any of our collectors can help us, we shall be greatly obliged.

As we are closing our net around what we have been able to catch concerning *Agriades coridon*, we find that we should be glad of further details concerning some of the less known races of this species. We particularly want data comparing the spring form of the Riviera race (from Hyères, Draguignan, Ste. Maxime, etc.), *i.e.*, var. *meridionalis* gen. 1 *vernalis* with the summer form gen. 2 *hiemalis*, if there be any real difference between them. One wonders whether the rather smooth, delicate, but dull, silvery-blue ♂ with its variable margin to forewings, and ♀ with deep brown underside, is merely the spring form of Bartel's *rezniceki*, which he describes in some particulars so differently. Again, does anyone know anything about the May examples of the Pont du Gard

race, which appears to be apparently a little larger than *meridionalis* as we know it. It may be that here again the species is double-brooded, although, as it is well-known in Britain and Central Europe to extend its appearance from the end of June to October in different seasons as a single-brood, it wants breeding to prove the fact.

We also want to find out as far as possible, the distribution—aberrationally and racially—of the very broad *marginata*-form of *A. coridon* in which the dark margin of the forewing in the ♂ is not only very wide, but carried along the costa almost, or quite, to the usually fairly well-developed discoidal lunule. In the British Museum coll., the "Mutzell" examples of this form are labelled "Germany," but so is everything from the "Mutzell coll.," although it is quite clear in some cases, that the specimens are not even European. Our best examples are labelled "Igman (Burr)," and it certainly occurs aberrationally in England, the Pyrénées, etc., but it is supposed to be in its most extreme form a German race, and one would like to know more about it. We also want information concerning the occurrence of the *addenda*, *basijuncta*, and *costajuncta* forms in England or abroad.

We should further like to get in touch with anyone who has collected in the Pyrenees, and can give us any clue to what Keferstein's undescribed *nirifera* may be. Are the Pyrenean examples, upper- or underside, anywhere sufficiently peculiar locally to lead Keferstein to suggest this name? The Spanish examples have been treated so hopelessly, that one hardly knows how to ask for help; the collectors there appear to have accepted at various times, any name for any form. The large pale race of the south, white above, with faint marginal border, and white below with small spots (= *albicans*, BdV.), the smaller whitish race from Aragon, &c., with well-defined marginal band, and well-spotted underside (= *arragonensis*, Gerh.), the pale blue-grey form from Albarracín, etc., with weak marginal borders, and fairly-defined spots on the underside (= *caerulescens*, n. n. = *albicans*, H.-Sch.), and the beautiful blue *hispana*, H.-Sch., to which the name *corydonius* has been for years erroneously applied, are all clearly-enough defined and well-known as races, but have rarely been called by the names that belong to them.

The Rev. C. R. N. Burrows, The Vicarage, Mucking, Essex, who is at work on the genitalia of the Geometrids, has now obtained all his requirements except the ♀ of *Phibalapteryx lapidata*, and both sexes of *P. polygrammata* and *Cleora riduaria*. If anyone can oblige with British or Continental material, he would be greatly indebted. Other species wanted for examination are *Boletobia fuliginaria*, *Zanclognatha emortualis*, *Madopa salicalis*, *Pyralis tienigialis*, *Botys nubilalis*, *Scopula decrepitalis* ♀, *Psamotis pulveralis* ♀, *Margarodes unionalis*, *Diasema ramburialis*, *Antigastra catalaunalis*, and *Acentropus niveus*.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—November 3rd, 1909.—
PARNASSIUS APOLLO FROM THE SWISS JURAS.—Mr. A. E. Gibbs brought for exhibition a case containing a series of *Parnassius apollo* taken by him this year in the Vallée de Joux, Swiss Juras, at 3300 feet, and at Éclépens. He pointed out that the specimens found in the Jura, have a tendency toward the form known as ab. *pseudonowioni*, and that this is more strongly marked in examples from the lower level at

Éclépens. RARE AND ABERRANT LEPIDOPTERA.—Mr. H. J. Turner exhibited (a) two extremely small specimens of *Cupido minimus*, taken with normal-sized examples near Winchester, on June 12th, 1909. The expanse of wings is 15mm.; he also showed similarly small specimens from Galway and from the Sépey Road, near Aigle, Rhone Valley; (b) an example of *Anthrocera achilleae*, in which the blotches on the forewings are all fused together, giving at a casual glance the appearance of a small *A. purpuralis*: it was captured at Gex, Ain, France, on August 11th, 1909; (c) a white aberration, ab. *alba*, of *Rumicia phlaeas*, taken at Brasted, Kent, on August 28th. This rare form has usually been reported as ab. *schmidtii*, but as Mr. Tutt has pointed out in "British Lepidoptera," vol. viii., the latter form is straw-coloured; and (d) examples of *Heodes virgaureae* ab. *miegii*, a form of the ♂ in which a large discoidal spot, and a transverse partial row of black dots near the apex of the forewings are developed, and var. *zermattensis*, a form of the ♀ in which the usual copper colour is suppressed, and much of the area has become more or less dusky; they were taken at Zermatt in early August. The form *miegii* is said to be unusual outside Spain, but Mr. Turner has seen quite a number with the spots more or less apparent. The var. *zermattensis* has the usual form of the ♀ at Zermatt.

NEW AND RARE BRITISH BEETLES.—Mr. G. C. Champion exhibited specimens of *Melanophila acuminata*, De Geer, *Criocephalus ferns*, Muls., and other coleoptera found on pines near Woking. He called attention to the numerous interesting forms that had been found on pines during recent years, not only in the south of England, but in Scotland also. The Buprestid had probably not been searched for previously at the right season—during the driest time at the end of the summer and early autumn—at a period when few insects are to be found. He stated that he had met with various other Buprestids, both in Spain and in Tropical America (e.g., *Buprestis sanguinea*, F., and *Actenodes chalybeitarsis*, Chevr.), in the dry season, or when the trees had been scorched by fire.

NEW BRITISH COLEOPTERA.—Dr. Norman H. Joy showed the following: *Epipedus nigricans*, Thoms., *Pityogenes trepanatus*, Nordl., both taken at Blair Atholl, Perthshire, September, 1909; *Lathrobium dilutum*, Er., captured at Dalwhinnie, Inverness-shire, September, 1909; *Cryptophagus pallidus* var. *argentea*, var. nov., differing from the type form in having silvery pubescence; he also exhibited *Philonthus trossulus*, Nord., from Dalwhinnie; the penis of *Gnathoncus nidicola*, Joy, and *G. rotundatus*, Kugel, and of *Anisotoma anglica*, Rye, and *A. cinnamomea*, Er.; and a series of *Sunius lyonesius*, Joy, from the Scilly Isles, and he pointed out the structural characters by which this species may be distinguished from *S. angustatus*.

RARE BRITISH DRAGONFLY.—Mr. W. J. Lucas exhibited a very fine ♀ example of *Sympetrum fonscolombii*, Sélys, exhibited on behalf of Mr. F. W. Edwards, of Cambridge, who took it on September 24th, 1908, at Frensham Pond, in Surrey. Probably this species is always an immigrant with us, and but few specimens have been recorded. One ♀ in Stephens' cabinet, was supposed to have been taken near London. McLachlan possessed a ♂ from T. Desvignes' collection. A ♂ was taken at Deal in 1881. Messrs. Briggs took 17 ♂s in June, 1892, on Ockham Common, in Surrey. In June, 1903, W. C. Boyd secured a ♀ near Irewooft,

in west Cornwall. Mr. Edwards' insect is therefore only the twentieth localised and well-authenticated British specimen. A ♀ was taken in Alderney on July 11th, 1899, by Mr. E. D. Marquand, which was at that time, it is believed, the only dragonfly that had ever been taken in the island. *November 17th, 1909.*—NOMINATION OF OFFICERS AND COUNCIL.

—It was announced that the Council had nominated the following Fellows to act as Officers, and to serve on the Council of the Society for the session 1910-11—President: Dr. Frederick Augustus Dixey, M.A., M.D.; Treasurer: Mr. Albert Hugh Jones; Secretaries: Mr. H. Rowland-Brown, M.A., and Commander James J. Walker, M.A.; Librarian: Mr. George Charles Champion, F.Z.S.; as members of Council: Professor T. Hudson-Beare, F.R.S.E., Mr. G. T. Bethune-Baker, F.L.S., Dr. Malcolm Burr, D.Sc., F.L.S., F.Z.S., Mr. H. St. J. K. Donisthorpe, F.Z.S., Mr. Albert Harrison, F.L.S., F.C.S., Mr. Selwyn Image, M.A., Dr. Karl Jordan, Ph.D., Mr. Hugh Main, B.Sc., Mr. Alfred Sich, Mr. Henry Jerome Turner, Mr. Rowland E. Turner, and Mr. James W. Tutt. OBITUARY.—The decease of Dr. Gustave Kraatz, of Berlin, was announced, and Dr. Karl Jordan gave a short account of the services rendered to entomological science by the deceased gentleman, who was for many years a Fellow of the Society. TREE ATTRACTIVE TO HYMENOPTERA.—The Rev. F. D. Morice brought for exhibition a case of Aculeate Hymenoptera, representing many different groups visiting a solitary tree of *Ochradenus baccatus*, Del., in the neighbourhood of Jericho. They showed a remarkable similarity in points of colour, etc., and neither plant nor insects, in most cases, were to be found elsewhere in the region.

ABERRANT PALÆARCTIC BUTTERFLIES.—Mr. H. J. Turner exhibited—(a) A ♂ *Melitaea didyma*, in which the greater portion of the black pigment had more or less failed to develop, the usual dark markings being all of a light grey; some of the spots had a few scattered black scales, and, when examined with a lens, numerous scales were seen to have only the tips black; the black markings near the insertions of the wings, were of the normal density of colour, and the ground colour was about the usual depth of tint. The insect was captured at Zermatt on August 3rd, 1909. (b) A specimen of *Brenthis euphrosyne*, taken in the same locality on July 31st, the spots composing the submarginal line well developed, and most of them elongated towards the base. (c) An example of *Hirsutina damon*, in which there was no trace of the transverse row of eye-spots on the underside of the forewings, the discoidal spot only being present. The insect was taken on the road leading from Aigle to le Sépey on July 29th of the present year. (d) Two series of *Melitaea parthenie* var. *raria*, the first taken on the Riffel-alp on August 1st, and the second in the Zmutt Valley on July 31st. It was stated that Dr. Chapman considers *raria* to be a distinct species, on account of the distinctive characters of its genitalia.

NEW ABERRATIONS OF *NONAGRIA EDELSTENI*.—Mr. H. M. Edelsten exhibited a bred series of *Nonagria edelsteni* from Sussex, including two new aberrations, for which he suggested the names *rufescens* and *fusca*. He mentioned that, as far as he was aware, these two forms had not been previously noted on the continent. He showed, also, ova and pupa *in situ*, with photographs by Mr. Hugh Main, to illustrate the life-history of the species. LARVAL HABIT OF *OSMYLUS*.—Mr. W. J. Lucas exhibited two imagines and a larva of the finest

of our Neuroptera, *Osmylus chrysops*. The exhibit was made on account of the larva having been taken by Dr. D. Sharp near Queen's Bower in the New Forest. It pierces and sucks dry some small animals, but its life-history is not well known. The mouth-parts are similar to those of *Hemerobius* and *Chrysopa*, which feed on the juices of aphides. *O. chrysops* is, however, at least partly aquatic. It is nearly related to *Sisyra*, of which we have three species, one at least of which feeds on *Spongilla fluvialis*. COLOUR VARIATION OF *AGLAIS PUPÆ*.—Mr. A. W. Bacot showed two boxes containing pupal cases of *Aglaia urticae* collected by Mr. Hugh Main in one locality. Those taken from the foodplant were yellowish-white; those taken from the cage in which the larvae pupated quite black, thus demonstrating the effect of surroundings upon the pupal coloration.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 28th, 1909.—LARVÆ OF *PHARETRA RUMICIS*.—Mr. Tonge exhibited living larvæ of *Pharetra rumicis* from Hatfield, feeding on sallow. VARIATION IN *HYLOPHILA PRASINANA*.—Mr. South, a series of *Hylophila prasinana* bred from Scarborough, in some of which a brilliant red coloration had developed. RARE HOMOPTERON.—Mr. W. West, specimens of *Idiocerus aurentulus* from Blackheath, a species that had only once before been taken in Britain. RACIAL DIFFERENCES IN *AGROTIS CINEREA*.—Mr. Newman, series of *Agrotis cinerea* from Kent, Lewes and Brighton. The Sussex races were much the smaller. PERTHETRIA DISPAR CAPTURED AT LARGE IN ENGLAND, etc.—Mr. R. Adkin, a ♀ of *Porthetria (Ocneria) dispar*, taken at rest on an elm-trunk at Eastbourne, and read notes on the unusual occurrence. He also showed a series of *Scopula decrepitalis*, taken near Rannoch in June last. CROSS-PAIRING IN NOCTUID SPECIES.—Mr. Buckstone recorded the finding of *Noctua xanthographa* ♂, and *Luperina testacea* ♀, in cop., on September 27th, and the secretary drew attention to the large number of similar strange unions noted in *A Natural History of the British Lepidoptera*, vol. v., pp. 2-3. DEPRESSARIA PUTRIDELLA.—Mr. Sich, for Mr. Green, this new British species recently recorded, and its life-history described in detail, in the *Ent. Record* for October, November, and December (1909). November 11th, 1909.—RARE HOMOPTERON.—Mr. West (Greenwich), the very rare Homopteron, *Ulopa tritria*, from Chipstead, and *Limotettix stactogala* from Deal on tamarisk. LAGGARD AGRIADES THETIS.—Dr. Chapman, a living bred example of *Agriades thetis (bellargus)*. SYRPHID PATTERN.—Mr. Andrews, British *Syrphidae* showing how the general appearance of these insects is "broken up" by the modification of the darkened portion of the wings, and the light area at the base of the abdomen. ABERRATIONS OF AGRIADES THETIS AND A. CORIDON.—Dr. Hodgson, specimens of *Agriades coridon* with white submarginal wedges and partial absence of spots on the underside of the hindwings, and also examples of *A. thetis (bellargus)* without discoidals. ATTEMPTED AUTUMN BROOD OF PYRAMEIS ATALANTA.—Mr. Newman, nearly full-fed larvæ of *Pyrameis atalanta* from ova laid in August.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—October 18th, 1909.—Annual Exhibition.—Mr. B. H. Crabtree exhibited the following species:—*Taenioampa incerta*, *T. miniosa*, *T. munda*, and *Pachnobia leucographa*, from Lakeside, Windermere; a varied series of *Cosmotriche potatoria*, from Berkshire; a series of *Arctia caia*, showing

the usual range of minor variation, *Aglais urticae*, approaching var. *ichnusa*, and *Dimorpha versicolor* from Aviemore; *Dianthoecia carpophaga*, pale forms from Brighton; *Apatela aceris* from Sandown, Isle of Wight; *Cucullia asteris* from the London district, and *Phorodesma smaragdaria* from Essex. Major Woodforde, *Zonosoma pendularia* var. *subroseata*, and a new aberration of the same species like *subroseata*, but with the pink area ochreous, which he had bred this year for the first time. Mr. George Arnold, Hymenoptera, among them being *Crabro aphidum*, *Formicocenus nitidulus*, etc., the last out of nests of *F. rufa* from the New Forest. Mr. F. N. Pierce exhibited on behalf of Mr. T. Baxter, of St. Anne's, a *Luperina* allied to *L. testacea*, and supposed to be *L. nickerlii*. This species, only two specimens of which have been previously taken in Britain, both by Mr. Baxter of St. Anne's, has occurred again this year, about a dozen specimens having been captured. Mr. Pierce also exhibited microscopic slides of the genitalia, showing the characters he relied upon for differentiating Mr. Baxter's captures from *L. testacea*. The same member also showed *Abra caspia grossulariata* ab. *flavofasciata*, from Wallasey, *Notolophus (Orgyia) gonostigma*, *Celastrina argiolus* from Essex, *Triphaena comes* from Isle of Eigg, and other local species. Mr. W. Mansbridge showed a long series of *Boarmia repandata* var. *nigra*, from Knowsley, *Melitaea aurinia* from Barmouth, and a series of *Eupithecia ralerianata* from Delamere Forest, this being the first record of the latter species for Cheshire. Mr. C. E. Raven exhibited lepidoptera from Rye, Sussex, including a varied series of *Mesotype virgata*, *Aplecta nebulosa* ab. *robsoni*, from Delamere, and *Gnophos obscuraria* ab. *fasciata*, from Folkestone. Mr. Robert Tait, Junr., brought two drawers of lepidoptera, the result of the season's work, including *Aplerta nebulosa* ab. *robsoni*, from Delamere, *Polia chi* ab. *olivacea*, from Huddersfield, *Agrotis ayathina*, from North Wales, *A. ashworthii*, very light and very dark forms from North Wales, *Cucullia verbasci*, bred from larvæ found 1907, *Cymatophora ridens* from New Forest larvæ, *Eupithecia pumilata* from North Wales, and various species from the south of England, amongst them, *Moma orion* from Abbott's Wood.

CONTENTS OF VOLUME XXI.

	PAGE.
ARANEINA	19, 276, 289
COLEOPTERA	25, 43, 189, 231, 257, 278, 287
CURRENT NOTES	21, 47, 72, 94, 119, 140, 189, 219, 238, 265, 296
DIPTERA	17, 50, 276, 288
HEMIPTERA	276
HYMENOPTERA	257, 276, 269, 290
LIFE-HISTORIES, LARVÆ, ETC.	44, 137, 188, 237, 291
NOTES ON COLLECTING, ETC.	20, 46, 72, 93, 118, 137, 185, 216, 233, 264, 292
ORTHOPTERA	8, 40, 169
SCIENTIFIC NOTES AND OBSERVATIONS	46, 93, 119, 185, 218, 236
VARIATION	45, 136, 196, 218, 235
ABERRATIONS AND VARIETIES OF :— <i>Abraxas grossulariata</i> (Wood-cut), 197; ab. <i>varleyata</i> , 131, 270; ab. <i>lacticolor</i> , 131, 270; <i>Aglais urticae</i> , 4, 83 (plate), 106, 211; <i>Agriades coridon</i> , 186, 262, 299, 300; <i>A. thetis</i> (<i>bellargus</i>), 277; <i>Brenthis selene</i> , 218; <i>Celastrina argiolus</i> , 99; <i>Chrysophanus hippothoë</i> , 128; <i>Coenobia rufa</i> , 4, 110; <i>Cyaniris semiargus</i> , 196; <i>Erebia aethiops</i> , 225; <i>Euchelia jacobaeae</i> , 99; <i>Heodes virgavreæ</i> , 225, 301; <i>Lasiocampa quercus</i> , larvæ and imagines, 45; <i>Melan-</i>	

PAGE 304

argia galatea, 252; *Noctua glareosa*, 76; *Plebeius aegon*, 250; *P. argyrognomon*, 251; *Polygonia c-album* (plate), 102; *Polyommatus icarus*, 211, 226, 230; *Rumicia phlaeas*, 100, 235; *Vanessa io* (plate), 86, 212; *Zonosoma pendularia*

ADDITIONS TO THE BRITISH LIST:—*Abraxas grossulariata* ab. *albipalliata*, Raynor, 272; ab. *albispaciata*, Raynor, 272; ab. *chrysostrota*, Raynor, 271; ab. *cuneata*, Raynor, 272; ab. *cupreofasciata*, Raynor, 272; ab. *flavipalliata*, Raynor, 272; ab. *gloriosa*, Raynor, 271; ab. *igneofasciata*, Raynor, 272; ab. *infrabifasciata*, Raynor, 272; ab. *infrafasciata*, Raynor, 272; ab. *nigra*, Raynor, 272; ab. *nigrocaerulea*, Raynor, 272; ab. *nigrofasciata*, Raynor, 272; ab. *radiata*, Raynor, 272; ab. *rubrolutea*, Raynor, 272; ab. *iochalea*, Raynor, 271; ab. *lactea-nigra*, Raynor, 271; ab. *nigrocostata*, Raynor, 271; ab. *nigrovenata*, Raynor, 271; *Aglais urticae* ab. *alba*, Raynor, 7; ab. *adumbrata*, Raynor, 8; ab. *angustihalteata*, Raynor, 7; ab. *brunneo-violacea*, Raynor, 7; ab. *clarirufa*, Raynor, 7; ab. *cuneatiguttata*, Raynor, 7; ab. *flavotessellata*, Raynor, 7; ab. *fulva*, Raynor, 7; ab. *fulvomarginata*, Raynor, 7; ab. *griseomarginata*, Raynor, 7; ab. *ignea*, Raynor, 7; ab. *infraradiata*, Raynor, 8; ab. *infuscata*, Raynor, 7; ab. *latericolor*, Raynor, 7; ab. *luna*, Reuss, 211; ab. *lutea*, Raynor, 7; ab. *magniguttata*, Raynor, 7; ab. *magnilunulata*, Raynor, 8; ab. *magninotata*, Raynor, 8; ab. *magnipuncta*, Raynor, 8; ab. *nigridorsuta*, Raynor, 8; ab. *nigricostata*, Raynor, 7; ab. *nubilata*, Raynor, 7; ab. *obscura*, Raynor, 7; ab. *parviguttata*, Raynor, 7; ab. *parvilunulata*, Raynor, 8; ab. *parvinotata*, Raynor, 8; ab. *parvipuncta*, Raynor, 8; ab. *polychloroides*, Raynor, 7; ab. *punctijuncta*, Raynor, 8; ab. *radiata*, Raynor, 7; ab. *rubrochrea*, Raynor, 7; ab. *strigata*, Raynor, 7; ab. *subtus-lactea*, Raynor, 8; ab. *subtus-rufa*, Raynor, 8; ab. *testudinea*, Raynor, 7; ab. *tripuncta*, Raynor, 8; ab. *unipuncta*, Raynor, 8; *Anaurosooma flavipes*, Fln., 194; *Anaspis hudsoni*, Donisthorpe, 60; *Anaphothrips orchideus*, Bagnall, 51; *Aphodius scybalarius* ab. *nigrescens*, Muls., 28; *Araeocerus fasciculatus*, de Geer, 27; *Arctia caja* ab. *clarki*, Tutt, 88; *Bledius denticollis*, Fauvel, 48; *Bruchus rufimanus* var. *velutinus*, Muls., 27; *Calodera rufescens*, Kraatz, 94; *Carabus violaceus* var. *sollicitans*, Hartert, 27; *Ceuthorrhyncus mogantiacus*, Schultz, 27; *Chaetocnema arida*, Foud., 259; *Clambus punctulum*, Beck, 26; *Clinodiplosis equestris*, Wagner, 242; *Cnemacantha muscaria*, Fln., 240; *Coenobia ruja* ab. *fuscus*, Bankes, 4; *Corticaria eppelsheimi*, Reitt., 26; *C. linearis*, Payk., 26; *C. longicollis*, Zett., 26; *Comostigmus testaceipes*, Kief., 290; *Crypthaloides donisthorpei*, Formanek, 49; *Cryptophagus hirtulus*, Kr., 26; *C. lovendali*, Gangl., 26; *C. pallidus* var. *argentea*, Joy, 301; *Cryptothrips dentipes*, Reut., 189; *Cynips obliquus*, How., 74, 124; *Depressaria putridella*, Hb. (plate), 194, 221 (plate), 253, 276; *Dromius angustus*, Brulle, 25; *Dryops (Parnus) anglicanus*, Edwards, 240; *D. luridus*, Er., 27; *Eccoptomera ornata*, Lw., 240; *Empoasca butleri*, Edw., 124; *E. populi*, Edw., 124; *Epipeda nigricans*, Thoms., 301; *Euphorus bistrigatus*, Morley, 219; *Formica fusca* var. *rufescens*, Forel, 258; *Gonatopus myrmecophilus*, Kieff, 17; *Hellephorus griseus*, Hbst., 25; *Homalota (Acronota) fussi*, Bernh., 50; *H. purens*, Muls. et Rey, 48; *H. scotica*, Elliman, 33; *Homalium brevicolle*, Thoms., 146; *Idiocerus rutilans*, Kchbm., 48; *Laccoius scutellaris*, Motsch., 240; *Lathrobium dilutum*, Er., 301; *Litargus coloratus*, Rosen., 27; *Longitarsus nigerrimus*, Gyll., 27; *Linnophilus fuscinervis*, Zett., 240; *Megathrips nobilis*, Bagnall, 189; *Micropeplus caelatus*, Erichson, 219; *Milichia ludens*, Wahl., 289; *Miltogramma germari*, Mg., 194; *Myrmecopora brevipes*, Butler, 50, 124; *Nonagria edelsteni* ab. *fuscata*, Edl., 302; ab. *rufescens*, Edl., 302; *Notiophilus aquaticus* var. *strigifrons*, Baudi, 27; *Ocyusa defecta*, Muls. et Rey, 194; *Oxyopoda perplexa*, Muls., 25; *Pegomyia scitenstettensis*, Strobl, 241; *Plebeius argus* var. *cretaceus*, Tutt, 59; var. *masseyi*, Tutt, 59; *Philonthus concinnus*, Grav., 26; *Phora aequalis*, Wood, 50, 74; *P. affinis*, Wood, 50, 74; *P. albipennis*, Wood, 120; *P. altifrons*, Wood, 120; *P. alticolella*, Wood, 120; *P. angusta*, Wood, 219; *P. armata*, Wood, 50, 74; *P. barbulata*, Wood, 120; *P. beckeri*, Wood, 120; *P. ciliata*, Wood, 74; *P. cilipes*, Wood, 120; *P. collini*, Wood, 50, 74; *P. conformis*, Wood, 120; *P. crassipes*, Wood, 74; *P. derasa*, Wood, 219; *P. discreta*, Wood, 219; *P. diversa*, Wood, 120; *P. flava*, Wood, 74; *P. flavescens*, Wood, 50, 74; *P. frontalis*, Wood, 120; *P. fumata*, Malloch,

50; <i>P. fungivora</i> , Wood, 120; <i>P. fusca</i> , Wood, 219; <i>P. glabrifrons</i> , Wood, 50, 74; <i>P. hirtiventris</i> , Wood, 219; <i>P. hortensis</i> , Wood, 120; <i>P. humili</i> , Wood, 120; <i>P. infraposita</i> , Wood, 120; <i>P. longiseta</i> , Wood, 50, 74; <i>P. lutea</i> , Mg., 120; <i>P. mullochi</i> , Wood, 50, 74; <i>P. melanophthalma</i> , v. Ross., 120; <i>P. minor</i> , Wood, 74; <i>P. nigripes</i> , Wood, 120; <i>P. nudis</i> , Wood, 74; <i>P. nudiventris</i> , Wood, 219; <i>P. obscuripennis</i> , Wood, 120; <i>P. parva</i> , Wood, 50, 74; <i>P. pleuralis</i> , Wood, 120; <i>P. propinquua</i> , Wood, 50, 74; <i>P. rivalis</i> , Wood, 50, 74; <i>P. rufid</i> , Wood, 50; <i>P. scutellaris</i> , Wood, 120; <i>P. sordida</i> , Wood, 120; <i>P. subpleuralis</i> , Wood, 120; <i>P. subtumida</i> , Wood, 219; <i>P. surdifrons</i> , Wood, 50, 74; <i>P. uliginosa</i> , Wood, 50, 74; <i>P. unguicularis</i> , Wood, 120; <i>P. variabilis</i> , Wood, 120; <i>P. vernalis</i> , Wood, 120; <i>Pityogenes trepanatus</i> , Nördl., 301; <i>Planopria pedestris</i> , Kieffer, 290; <i>Pyralis costalis</i> ab. <i>rufescens</i> , Mathew, 36; <i>Rhoptromeris formicaria</i> , Kieff., 17; <i>Scoparia ambigualis</i> ab. <i>crossi</i> , Banks, 94; <i>Soxotropa subterranea</i> , Kieff., 17; <i>Sphaerolaelaps holothyroides</i> , Leonardi, 20; <i>Spilomma falconivibrans</i> , Morley, 219; <i>Tetramopria donisthorpei</i> , Kieff., 290; <i>T. femoralis</i> , Kieff., 290; <i>Thinobius pallidus</i> , Newbery, 48; <i>Trachyuropoda coccinea</i> var. <i>sinuata</i> , Berl., 20; <i>Trichothrips copiosus</i> , Uzel, 189; <i>T. semicaucus</i> , Uzel, 189; <i>Trichopteryx intermedia</i> var. <i>thomsoni</i> , L.B.E., 58; <i>Tychocryba fratrecula</i> , Edw., 124; <i>T. frustrator</i> , Edw., 124; <i>Urapteryx sanibucaria</i> ab. <i>cuspidaria</i> , Bird	235
EGGS OF:— <i>Coenobia rufa</i> , 109; <i>Colias phicomone</i> , 292; <i>Fredericina calodactyla</i> , 111; <i>Metrocampa marginalaria</i> , 291; <i>Pieris manni</i> , 39; <i>Thaleria fimbrialis</i>	291
ERRATA:—	93, 100, 264
LARVÆ OF:— <i>Coenobia rufa</i> , 109; <i>Depressaria putridella</i> (plate), 277; <i>Eupithecia fraxinata</i> , 237; <i>Nepticula acetosae</i> (plate), 103; <i>Nomiades (Glaucopsyche) melanops</i> , 62; <i>Phibalapteryx lapidata</i> , 208; <i>Pieris manni</i> (plate)	66
GENERA, SPECIES, VARIETIES, AND ABERRATIONS NEW TO SCIENCE:— <i>Abraxas grossulariata</i> ab. <i>albipalliatata</i> , Raynor, 272; ab. <i>alispaciata</i> , Raynor, 272; ab. <i>cuneata</i> , Raynor, 272; ab. <i>cupreofasciata</i> , Raynor, 272; ab. <i>flavipalliatata</i> , Raynor, 272; ab. <i>igneofasciata</i> , Raynor, 272; ab. <i>infrabifasciata</i> , Raynor, 272; ab. <i>infrafasciata</i> , Raynor, 272; ab. <i>nigra</i> , Raynor, 272; ab. <i>nigrocacrula</i> , Raynor, 272; ab. <i>nigrofasciata</i> , Raynor, 272; ab. <i>radiata</i> , Raynor, 272; ab. <i>rubrolutea</i> , Raynor, 272; <i>A. grossulariata</i> ab. <i>flavofasciata</i> (= <i>lacticolor</i>) ab. <i>chrysostrota</i> , Raynor, 271; ab. <i>gloriosa</i> , Raynor, 271; ab. <i>iochalcia</i> , Raynor, 271; ab. <i>lactea-nigra</i> , Raynor, 271; ab. <i>nigrocostata</i> , Raynor, 271; ab. <i>nigrorenata</i> , Raynor, 271; <i>Aglaia urticae</i> ab. <i>alba</i> , Raynor, 7; ab. <i>adumbrata</i> , Raynor, 8; ab. <i>angustibalteata</i> , Raynor, 8; ab. <i>brunnea-violacea</i> , Raynor, 7; ab. <i>clarirufa</i> , Raynor, 7; ab. <i>cuneatiguttata</i> , Raynor, 7; ab. <i>fasciata</i> , Reuss, 86; ab. <i>flavotessellata</i> , Raynor, 7; ab. <i>fulva</i> , Raynor, 7; ab. <i>fulvomarginata</i> , Raynor, 7; ab. <i>griseomarginata</i> , Raynor, 7; ab. <i>ignea</i> , Raynor, 7; ab. <i>infraradiata</i> , Raynor, 8; ab. <i>infuscata</i> , Raynor, 7; ab. <i>iformis</i> , Reuss, 83; ab. <i>ioprotoformis</i> , Reuss, 86; ab. <i>latericolor</i> , Raynor, 7; ab. <i>latibalteata</i> , Raynor, 8; ab. <i>luna</i> , Reuss, 211; ab. <i>lutea</i> , Raynor, 7; ab. <i>magniguttata</i> , Raynor, 7; ab. <i>magnilunulata</i> , Raynor, 8; ab. <i>magninotata</i> , Raynor, 8; ab. <i>magnipuncta</i> , Raynor, 8; ab. <i>nigricostata</i> , Raynor, 7; ab. <i>nigridorsata</i> , Raynor, 8; ab. <i>nubilata</i> , Raynor, 7; ab. <i>obscura</i> , Raynor, 7; ab. <i>pareiguttata</i> , Raynor, 7; ab. <i>parrilunulata</i> , Raynor, 8; ab. <i>parrinotata</i> , Raynor, 8; ab. <i>pareipuncta</i> , Raynor, 8; ab. <i>polychloroides</i> , Raynor, 7; ab. <i>punctijuncta</i> , Raynor, 8; ab. <i>radiata</i> , Raynor, 7; ab. <i>rubrochrea</i> , Raynor, 7; ab. <i>strigata</i> , Raynor, 7; ab. <i>subtus-lactea</i> , Raynor, 8; ab. <i>subtus-rufa</i> , Raynor, 8; ab. <i>testudinica</i> , Raynor, 7; ab. <i>tripuncta</i> , Raynor, 8; ab. <i>unipuncta</i> , Raynor, 8; <i>Agriades bellargus</i> (<i>thetis</i>) ab. (? et var.) <i>rufomarginata</i> , Wagner, 260; <i>A. coridon</i> var. <i>borussia</i> , Dadd, 261; var. <i>meridionalis-vernalis</i> , Tutt, 299; var. <i>meridionalis-hiemalis</i> , Tutt, 299; <i>Albulina</i> n. gen., Tutt, 108; <i>Anaphothrips orchidaceus</i> , Bagnall, 51; <i>Anaspis hudsoni</i> , Donisthorpe (plate), 60; <i>Anthrocera astragali</i> ab. <i>flava</i> , Kaufmann, 260; ab. <i>flareola</i> , Kaufmann, 260; <i>Aphantopus hyperanthus</i> , var. <i>rufilius</i> , Fruhst., 287; <i>Arandu</i> (<i>Pararge</i>) <i>schrenckii</i> ab. <i>menalcas</i> , Fruhst., 287; <i>Arctia caja</i> ab. <i>clarki</i> , Tutt, 88; <i>Argynnis aglaja</i> ab. <i>albomaculata</i> , Rbl., 259; <i>A. maja</i> var. <i>chrysobarylla</i> , Fruhst., 286; <i>A.</i>	

nitocris var. *nigrocoerulea* ab. *rufescens*, Cockerell, 186, 293; *A. niobe* ab. *extincta*, Rbl., 259; *Brenthis amathusia* var. *blachieri*, Fruhst., 286; var. *jugurtha*, Fruhst., 286; *B. daphne* var. *nikator*, Fruhst., 287; *B. dia* ab. *leonina*, Fruhst., 286; var. *setania*, Fruhst., 286; *B. euphrosyne* var. *densoi*, Fruhst., 287; ab. *rusalka*, Fruhst., 287; *B. pales* ab. *brogotarus*, Fruhst., 286; ab. (?) et var. *deflavata*, Wagner, 260; ab. *palustris*, Fruhst., 286; ab. *pseudothalia*, Rbl., 259; *Callophrys avis*, Chapman, 130; *Chrysophanus hippothoë* ab. *eisalpina*, Fruhst., 287; *Cloantha hyperici* var. *dilutior*, Wagner, 260; *Coenobia rufa* ab. *fusca*, Banks, 4; *Coenonympha arcana* var. *epiphilea*, Rbl. = *philea*, Frr. n. nom., 260; var. *orientalis*, Rbl., 260; ab. ♀ *schimae*, Rbl., 259; *C. iphis* ab. *albomarginata*, Tutt, 112; var. (?) ab.) *exommatica*, Rbl., 259; *Colias edusa* ab. *niediecki*, Strand, 261; *C. hyale* ab. *argyrea*, Lowe, 36; *Colón zebri*, Kr., 26; *Cryptophagus lorendali*, Gangl., 26; *C. pallidus* var. *argentea*, Joy, 301; *Cupido sebrus* ab. *caerulescens*, Rbl., 260; *Depressaria putridella* ab. *brunnea*, Sich, 253; *Dryops (Parnus) anglicanus*, Edwards, 240; *Epinephele jurtina* ab. ♀ *bioculata*, Rbl., 259; ab. ♀ *caeca*, Rbl., 259; ab. ♂ *hertha*, Heinrich, 261; ab. *phormia*, Fruhst., 287; *E. lycaon* ab. *ephisius*, Fruhst., 287; ab. *macrophthalma*, Fruhst., 287; ab. *nikokles*, Fruhst., 287; ab. *salona*, Fruhst., 287; *Erebia aethiops* ab. *caeca*, Rbl., 259; *E. ceto* ab. *albumaculata*, Rbl., 259; *E. adyta* ab. *etobyma*, Fruhst., 287; ab. *syrmia*, Fruhst., 287; *E. ligea* var. *takanonis*, Matsumura, 260; *Euphorus bistigmaticus*, Morley, 219; *Euvanessa antiope* ab. *asopos*, Fruhst., 286; ab. *yedanula*, Fruhst., 286; *Geometra papilionaria* ab. *alba*, Gillmer, 194; *Glaucopsyche cyllarus* ab. *subluggens*, Strand, 261; *G. melanops* ab. *unipuncta*, Rbl., 260; *Hadena pisi* var. *aestiva*, Gillmer, 216; *Holocacista* n. gen., Wlsn. and Drnt., 195; *Heodes phoebus*, 73; *H. virgaureae* ab. ♀ *alexandrae*, Fruhst., 287; ab. *osthelderi*, Fruhst., 287; ab. *pallida*, Rbl., 260; ab. *suldenensis*, Tutt, 229; *Hesperia alveus* var. *alticolor*, Rbl., 260; *H. carthami* var. *major*, Rbl., 260; *Hipparchia arethusa* ab. *segusiana*, Fruhst., 286; *H. statilinus* ab. *anapus*, Fruhst., 286; var. *anasarchus*, Fruhst., 286; var. *euryanax*, Fruhst., 286; *Hirsutina*, n. gen., Tutt, 108; *Homolota scotica*, Elliman, 33; *Issoria lathonia* ab. *I-nigrum*, Tutt, 225; *Klugia spinii* ab. *deleta*, Rbl., 260; *Larentia invidaria* ab. *nigrofasciata*, Wagner, 260; *L. lugubrata* ab. *denigrata*, Gillmer, 194; *Latiorina* n. gen., Tutt, 108; *Leucania comma* var. *engadinensis*, Wagner, 260; *Lowea alciphron* ab. ♂ *caerulescens*, Rbl., 260; var. *gaudeolus*, Fruhst., 287; var. *gordius* ab. *flavescens*, Tutt, 228; ab. *isokrates*, Fruhst., 287; ab. *romanorum*, Fruhst., 287; *L. dorilis* gen. vern. *vernalis* n. nom., Rbl., 260; *Lycaena arcas* ab. ♂ *emutata*, Marsch., 261; *L. arion* var. (?) ab.) *oefenia*, Tutt, 198; *L. cyane* var. *tarbagata*, Suschkin, 261; *Limenitis camilla* var. *glorifica*, Fruhst., 286; ab. *prodiga*, Fruhst., 286; ab. *puellula*, Fruhst., 286; *L. populi* ab. *eumenius*, Fruhst., 286; *Megathrips nobilis*, Bagnall, 189; *Melanargia galatea* ab. *aperta*, Rbl., 259; *Minois actaea* ab. *castiliiana*, Fruhst., 286; var. *podarcina*, Fruhst., 286; var. *serva*, Fruhst., 286; *Neptis themis* var. *illos*, Fruhst., 260; *N. sankara* var. *segesta*, Fruhst., 260; *Nonagria edelsteini* ab. *fusca*, Edlstr., 302; ab. *rufescens*, Edlstr., 302; *Nordmannia ilicis* ab. *latifasciata*, Rbl., 260; *Numeria pulveraria* var. *saturaria*, B.H., 260; *Nychiodes lividaria* var. *dalmatina*, Wagner, 260; *Oeneis aëlla*, ab. ♂ *unicolor*, Rbl., 259; *O. dubia* var. *staudingeri*, Aust., 260; *O. germana* ab. *depuncta*, Aust., 260; ab. *immaculata*, Aust., 260; ab. *tristis*, B.H., 260; *Orneodes dohertyi*, Walsm., 219; *Panurgus dentipes*, var. *magacephalus*, Cockerell, 269; *Pararge achine* ab. *althaea*, Rbl., 259; *P. deidamia* ab. *interrupta*, Fruhst., 287; var. *thyvia*, Fruhst., 287; *P. maera* ab. *atabyris*, Fruhst., 287; ab. *herdonia*, Fruhst., 287; ab. *ordona*, Fruhst., 287; var. *silymbria*, Fruhst., 287; *P. megaera* var. *depulverata*, Fruhst., 287; *Parnassius apollo* var. *silesianus*, Marsch., 261; *P. mnemosyne* ab. *arenaria*, Stichel, 261; ab. *taeniata*, Stichel, 261; *Phora aequalis*, Wood, 50, 74; *P. affinis*, Wood, 50, 74; *P. albipennis*, Wood, 120; *P. altifrons*, Wood, 120; *P. alticolella*, Wood, 120; *P. angusta*, Wood, 219; *P. armata*, Wood, 50, 74; *P. barbulata*, Wood, 120; *P. beckeri*, Wood, 120; *P. ciliata*, Wood, 74; *P. cilipes*, Wood,

120; *P. collini*, Wood, 50, 74; *P. conformis*, Wood, 120; *P. crassipes*, Wood, 74; *P. derasa*, Wood, 219; *P. discreta*, Wood, 219; *P. diversa*, Wood, 120; *P. flava*, Wood, 74; *P. flavescens*, Wood, 50, 74; *P. frontalis*, Wood, 120; *P. fumata*, Malloch, 50; *P. fungivora*, Wood, 120; *P. fusca*, Wood, 219; *P. glabriifrons*, Wood, 50, 74; *P. hirtiventris*, Wood, 219; *P. hortensis*, Wood, 120; *P. humilis*, Wood, 120; *P. infraposita*, Wood, 120; *P. longiseta*, Wood, 50, 74; *P. lutea*, Mg., 120; *P. mallochi*, Wood, 50, 74; *P. melanophthalma*, v. Ross., 120; *P. minor*, Wood, 74; *P. nigripes*, Wood, 120; *P. nudis*, Wood, 74; *P. nudiventris*, Wood, 219; *P. obscuripennis*, Wood, 120; *P. parra*, Wood, 50, 74; *P. pleuralis*, Wood, 120; *P. propinqua*, Wood, 50, 74; *P. rivalis*, Wood, 50, 74; *P. rufis*, Wood, 50; *P. scutellaris*, Wood, 120; *P. sordida*, Wood, 120; *P. subpleuralis*, Wood, 120; *P. subtumida*, Wood, 219; *P. surdifrons*, Wood, 50, 74; *P. uliginosa*, Wood, 50, 74; *P. unguicularis*, Wood, 120; *P. variabilis*, Wood, 120; *P. vernalis*, Wood, 120; *Pieris ergane* ab. *niediecki*, Strand, 261; *P. manni* gen. aest. *asta*, Fruhst., 260; var. *rossi* gen. vern. *farpa*, Fruhst., 260; *P. napi* var. *leorigilda*, Fruhst., 286; var. *nesis*, Fruhst., 286; *P. rapae* ab. *atomaria*, Fruhst., 260; var. *leucosoma*, Schawerda, 260; var. *lysicles*, Fruhst., 286; var. *micipsa*, Fruhst., 286; gen. vern. *vaga*, Fruhst., 260; *Planopria*, n. gen., Kieffer, 290; *P. pedestris*, Kieff., 290; *Plebeius argus* ab. *brañuelasensis*, Tutt; var. *cretaceus*, Tutt, 59; var. *massyaei*, Tutt, 59; var. *orientalis*, Tutt, 96; var. *pyrenaica*, Tutt, 96; var. *pyrenaica* ab. *hypochionoides*, Tutt, 96; var. *vigensis*, Tutt, 96; *P. argyrogynomon* var. *corsica*, Tutt, 59; *Polyommatus amandus* ab. ♀ *caerulea*, Rbl., 260; *P. eros* ab. ♀ *senilis*, Rbl., 260; *P. icarus* ab. *bion* (Koll i. l.), 260; ab. ♂ *livida*, Gillm., 260; var. *sardoa*, Wagner, 260; *P. meleager* var. *dalmatina*, Wagner, 260; ab. *obsoleta*, Rbl., 260; *Pontia daplidice* ab. *anastomosica*, Strand., 261; *Powellia orbifer*, ab. (var. gen. aest.) *minor*, Rbl., 260; *P. sao* ab. (var. gen. aest.), *minor*, Rbl., 260; *Pterophorus baccharidis*, Williams, 96; *Pyralis costalis* ab. *rufescens*, Mathew, 136; *Pyramies atlanta* ab. *rubria*, Fruhst., 286; *P. cardui* ab. *ocellata*, Rbl., 259; *Rhoptromeris formicaria*, Kieff., 17; *Rumicia phlaeas* ab. *oberthueri*, Blachier, 73; *Saturnia pavonia* ab. *angustata*, Schultz, 260; ab. *conversa*, Schultz, 260; ab. ♂ *decorata*, Schultz, 260; ab. *defasciata*, Schultz, 260; ab. *deflexa*, Schultz, 260; ab. *erythrina*, Schultz, 260; ab. *flavomaculata*, Schultz, 260; ab. *indentata*, Schultz, 260; ab. *makropis*, Schultz, 260; ab. ♂ *ochreofasciata*, Schultz, 260; ab. ♀ *reducta*, Schultz, 260; ab. *saturatior*, Schultz, 260; *S. pyri* ab. *fulvescens*, Schultz, 260; ab. *invittata*, Schultz, 260; ab. *subdiaphana*, Schultz, 260; *S. spini* ab. *contigua*, Schultz, 260; ab. *fusca*, Schultz, 260; ab. *microphthalmica*, Schultz, 260; ab. *subhyalina*, Schultz, 260; *Satyrus briseis* ab. *bataia*, Fruhst., 287; ab. *turatii*, Fruhst., 287; ab. *uniocellata*, Strand, 261; *S. hermione* ab. *australis*, Rbl., 259; *Scoparia ambigualis* ab. *crossi*, Bankes, 94; *Soxotropa subterranea*, Kieff., 17; *Spilomema*, n. gen., Morley, 219; *S. falconivibrans*, Morley, 219; *Taeniocampa stabilis* ab. *dalmatica*, Wagner, 260; *Tephronia sepiaria* ab. *leparia*, Rbl., 261; ab. *nigra*, Rbl., 261; *Tetramorphia donisthorpei*, Kieff., 290; *T. femoralis*, Kieff., 290; *Theretra porcellus* ab. *galbana*, Gillm., 260; *Thinobius pallidus*, Newbery, 48; *Urapteryx sambucaria* ab. *cuspidaria*, Bird, 235; *Vacciniina*, n. gen., Tutt .. . 108

NOTABLE CAPTURES:—*Acidalia immorata*, 57; *Egeria andrenaeformis*, 56, 93; *E. sphegiformis*, 56, 93; *Agrius convolvuli*, 21, 265; *Atemeles paradozus*, 287; *Anchomenus scitulus*, 232; *Camptogramma fluviata*, 72; *Cassida fastuosa*, 194; *Coccinella* 10-punctata ab. *confusa*, 136; *Colias edusa* var. *helice*, 264; *Cryphoea recisa*, 290; *Cymatophora ocularis*, 57; *Dalyzia* 16-guttata 194; *Eupithecia consignata*, 57; *Gonotopus distinctus*, 17; *Harpalus obscurus*, 231; *Hetaerus ferrugineus*, 195; *Idiocerus aurentulus*, 303; *Laphygma exigna*, 293; *Leucania faricolor*, 57; *L. l-album*, 265; *L. vitellina*, 72; *Limotettix stactogala*, 303; *Manduca atropos*, 234; *Noctuid*, a new, 220; *Oxypoda recondita*, 238; *Phryxus livornica*, 52, 72, 186; *Porthetria dispar*, 303; *Rumicia phlaeas* ab. *alba*, 235, 301; *Salticus formicarius*, 290; *Scoparia lineolea*, 293; *Seraptria fuscula*, 232; *Syrphus gravidator*, 17; *Sitotroga cerealella*, 86; *Stauropus fagi*, 187, 235; *Sympetrum fonscolombii*, 301; *Tinea caprimulgella*, 86; *Trechus rivularis*, 231; *Trogophloeus subtilis*, 231; *Tychius polylineatus*, 232; *Ulopa trivia*, 303

	PAGE.
OBITUARY :—Lajos Aigner-Abafi, 244 ; William H. Edwards, 193 ; John Adolphus Clark, M.P.S., L.D.S., F.E.S., 22 ; James Fletcher (Dr.), 145 ; Gustav Kraatz (Dr.), 302 ; Mark V. Slingerland (Professor)	142
PUPAE OF :— <i>Coenobia rufa</i> , 109 ; <i>Depressaria putridella</i> (plate), 277 ; <i>Nepticula acetosae</i> (plate), 106 ; <i>Nomiades (Glaucopsyche) melanops</i> , 62 ; <i>Pieris manni</i> (plate), 68 ; <i>P. rapae</i> (plate)	70
REVIEWS AND NOTICES OF BOOKS, ETC. :— <i>Ants found in Great Britain (Leicester Literary Society's Transactions)</i> , H. St. J. K. Donisthorpe, F.Z.S., F.E.S., 51 ; <i>Bulletino di Laboratorio di Zoologia Generale Agraria</i> , vol. iii, 239 ; <i>British Flies</i> , G. H. Verrall, F.E.S., 72 ; <i>Bulletin de la Société lépidoptérologique de Genève</i> , vol. i, (Professor) C. Blachier, 142 ; <i>Butterflies and Moths of the United Kingdom</i> , (Dr.) W. Egmont Kirby, 266 ; <i>Catalogue of Gynandromorphous Lepidoptera (Ent. Zeits. Guben)</i> , Oscar Schultz, 97 ; <i>Cross-breeding of two races of Acidalia virgularia</i> , The (Proceedings of the Royal Society), A. W. Bacot, F.E.S., and L. B. Prout, F.E.S., 120 ; <i>Dermoptera, On the classification of the</i> , (Deutsch. Ent. Zeitschrift), Malcom Burr, F.E.S., 119 ; <i>Descriptive Catalogue of the Dobrée Collection of European Noctuæ</i> , H. B. Browne, M.A., 298 ; <i>Directions for Collecting and Preserving Insects (Smithsonian Institution)</i> , Nathan Banks, 298 ; <i>Entomological Society of Ontario, Thirty-ninth Annual Report of</i> , 145 ; <i>Genitalia of the British Noctuidæ</i> , The, F. N. Pierce, F.E.S., 88 ; <i>Guide to the Natural History of the Isle of Wight</i> , A. F. Morey, F.L.S., 190 ; <i>Hand-book of Richmond Park</i> , The, Coryn de Vere, 48 ; <i>Iconographie des Noctuelles et Géomètres d'Europe</i> , M. Culot, 242 ; <i>Insect Stories</i> , (Professor) Vernon L. Kellogg, 74 ; <i>Moths of the British Islands</i> , The, R. South, F.E.S., 97 ; <i>A Natural History of the British Butterflies</i> , vol. iii, J. W. Tutt, F.E.S., 299 ; <i>Plume Moths of Ceylon</i> , The, Part i, T. Bainbrigge-Fletcher, R.N., F.E.S. 191 ; <i>Proceedings of the South London Entomological and Natural History Society for 1908-9</i> , The, 142 ; <i>Report and Proceedings of the Lancashire and Cheshire Entomological Society for 1908</i> , The Annual, 190 ; <i>Review of the Species of the Lepidopterous genus Lycenopsis, an Examination of the Male Ancillary Appendages</i> , A, (Proceedings Zool. Soc. Lond., August, 1909), (Dr.) T. A. Chapman, F.E.S., 238 ; <i>Revision of the Coleoptera belonging to the Tenebriode tribe of Eleodiini inhabiting the United States, etc.</i> , A Monographic, F. E. Blaisdell, 242 ; <i>Scaly-winged</i> , The, R. B. Henderson, M.A., 297 ; <i>South-Eastern Naturalist</i> , The, 243 ; <i>Survey and Record of Woolrich and West Kent</i> , The, 192 ; <i>Transactions of the Carlisle Natural History Society</i> , The, pt. i, 119, pt. ii, 191 ; <i>Transactions of the City of London Natural History Society</i> , The, 1908, 265 ; <i>Transactions of the Natural History of Northumberland</i> , etc., 51 ; <i>Voyage, Zoologique en Khroumirie</i> , M. Henri Gadeau de Kerville	73
SOCIETIES' REPORTS :— <i>City of London Entomological Society</i> , 52, 76, 100 ; <i>Entomological Society of London</i> , 98, 123, 194, 268, 300 ; <i>Lancashire and Cheshire Entomological Society</i> , 303 ; <i>South London Entomological and Natural History Society</i>	303
PAGE.	
Aberrations of <i>Abraxas grossulariata</i> (plate), 197 ; British butterflies, 211 ; Palaearctic butterflies, 302 ; <i>Rumia crataegata</i> , White 267	
<i>Abraxas grossulariata</i> at the Maddison sale, The, 87, 131, 270 ; Further notes on ..	270
Absence of dragonflies from Alderney, 302 ; <i>Scopelosoma satellitia</i> from Helston ..	293
Abundance of <i>Cupido minimus</i> , 188 ; <i>Pieris brassicae</i> in the Grisons	1
Acarina of ants' nests	20
Activity of <i>Iphiclidæ</i> <i>ajax</i> larva, 114, <i>Laertia philenor</i> larva ..	147
<i>Adkinia graphodactyla</i> , Notes on ..	126
Aegeriids, Searching for larvae of, 56, 93 ; Ignorance concerning early stages of	75
African Entomological Research Committee, An	241
<i>Alucitides</i> , A few notes on some of the British	207
Albinism in <i>Brenthis selene</i> , 218 ; <i>Rumicia phlaeas</i> ..	235, 301
Ancillary appendages of the Hesperiines of the "Alveus" group, Note on value of, 224 ; of the genus <i>Lycenopsis</i>	238
Androconial scales of <i>Pieris rapae</i> and <i>P. manni</i> (plate) ..	149
<i>Anthrocera exilans</i> ab. <i>pulchra</i> ..	227
Ants, attending larvae of <i>Nomiades</i>	

	PAGE.
(<i>Glauopsyche</i>) <i>melanops</i> , 61;	
Colonies extinguished by herbage, 195, 257; Guests, 17, 287;	
Treachery of guests of, 288; in breeding-cage, 151; Slave-raid of 257	
<i>Apion</i> , The genus, 231; Additions to those previously recorded from Ditchling .. 232	
Aposemes, Single and double .. 121	
Appeals for entomological material 118, 299, 300	
Asymmetrical <i>Lithocolletis concomitella</i> 87	
Bees, Some European 269	
Binomial nomenclature 242	
Bionomic notes on butterflies .. 140	
Birds, Attacks of, upon lepidoptera 118, 163, 220; As a factor in the production of mimetic resemblance in butterflies .. 99	
Breeding <i>Charaxes zoolina</i> , 268; <i>Dryas paphia</i> var. <i>valezina</i> , 268; <i>Phytodecta pallida</i> from the larva, On, 208; <i>Tephrosia bistortata</i> and hybrid <i>T. bistortata</i> \times <i>T. crepuscularia</i> , Notes on .. 125	
Broods of:— <i>Adkinia graphodactyla</i> , 126; <i>Agriades coridon</i> , 186, 250; <i>A. thetis</i> , 250; <i>Araschnia levana</i> and <i>prorsa</i> from one batch of eggs, 45; <i>Eupithecia pulchellata</i> , 216; <i>Hadena pisi</i> , 216; <i>Hypocrita jacobaeae</i> , 245; <i>Nepticula acetosae</i> , 103; <i>Papilio machaon</i> , 15; <i>Pieris manni</i> , 38; <i>Pyrameis atlanta</i> , 303; Spanish lepidoptera, 65; <i>Spilomena lubricipeda</i> , 268; <i>Tephrosia bistortata</i> .. 125	
Butterflies, bearing the marks of foes, 141; First appearance of, in 1909, 118; Notes on, 186; of Switzerland in 1908, 101, 134; Spring, of the Rhone Valley, 53; Swiss 264	
Butterfly, A new, from Southern France, 130; The Large Copper 154	
Cannibal larvæ of:— <i>Iphiclides ajax</i> , 115; <i>Laertius philenor</i> , 148; <i>Pieris manni</i> 40	
Cannibalism of <i>Tapinoma erraticum</i> 258	
<i>Callophrys avis</i> , a new butterfly from Southern France 130	
“Carneodes” group of the <i>Agrotidæ</i> , The 52	
<i>Chaetocnema arida</i> , A Species of Coleoptera new to Britain .. 259	
Chalk, Connection of, with <i>Agriades coridon</i> 262, 264	
Chattenden Woods, Ruined by Game-preserving 31, 33	
Chin-glands, of larvæ of <i>Pieris manni</i> 68	
Christmas MDCCCVIII. 24	
<i>Chrysophanus dispar</i> var. <i>rutilus</i> , A day with, 223; in Hungary .. 13	
Clothing-habit of <i>Phorodesma smaragdaria</i> 150	
<i>Cnethocampa processionea</i> , as type of the genus 230	
Coccidæ of ants’ nests 20	
Cocoons of <i>Cnethocampas</i> 230	
Cocoon-spinning of <i>Apanteles glomeratus</i> 261	
<i>Coenobia rufa</i> , Contributions to the life-history of 108	
Cold, Fatal effect of, upon Lepidoptera 21, 162, 163	
<i>Coleophora chalcogrammella</i> in Surrey 217	
Coleoptera, A note upon the dispersal of, 164; Pine-frequenting, 301; in the Isle of Wight, 272; Rare and interesting species, 28, 43, 44; of the Scilly Isles, 28; in Sussex, 1908 43	
Coleopterist, Retrospect of a, for 1908 25	
Collecting in Switzerland in 1908 .. 77	
Colour-change of the pupa of <i>Chrysophanus dispar</i> var. <i>rutilus</i> .. 188	
Colour-variation of <i>Aglais</i> pupæ, 303; of larvæ 115	
“Common everywhere” and “Local,” Suggested explanation of 165	
Comparison of <i>Anthocharis tagis</i> var. <i>bellezina</i> with <i>A. belia</i> , 151; <i>Callophrys avis</i> with <i>C. rubi</i> , 130; <i>Depressaria putridella</i> with allied species, 254-5; <i>Pieris manni</i> with <i>P. rapae</i> 37, 70, 71, 149	
Contribution to a list of the Macro-lepidoptera of Bucks 285	
“Cottoniers” and “Resiniers” 269	
Courting-habits of <i>Leptidia sinapis</i> , 119, 201; <i>Papilio aristolochiae</i> 164	
Cross-breeding of two races of <i>Acidalia virgularia</i> 98, 120	
Cross-pairing of <i>Noctua xanthographa</i> and <i>Luperina testacea</i> .. 303	
Cultivation, the probable cause of extinction of <i>Cyaniris semiargus</i> in Britain 132	
Darwin commemoration, The 181	
<i>Dasypolia templi</i> at Swanage, 137, 234; fondness for light, 178; at sugar 137, 234	
Day-flying habit of <i>Malocosoma castrensis</i> , 166; <i>Trichiura ilicis</i> ? 153	
Defoliation by larvæ 139, 185, 186, 217	
Degree of D.Sc. Oxford, conferred upon Mr. Malcolm Burr 194	
<i>Depressaria putridella</i> , A species new to Britain 194, 221, (plate) 253, (plate) 276, 303	
Description of <i>Anthrocera exulans</i> ab. <i>pulchra</i> , 227; <i>Coenobia rufa</i> ab. <i>fusca</i> , 4; <i>Depressaria putridella</i> , British specimens of .. 222	
Destruction wrought by larvæ of <i>Pieris brassicae</i> , 166; of butter-	

	PAGE.
flies in Ceylon by birds ..	163
<i>Dicranura vinula</i> in Meath Gardens, in London, E. ..	217
Differentiation of <i>Callophrys avis</i> and <i>C. rubi</i> , 130; of ♀ <i>Lowicia subalpina</i> and <i>Chrysophanus hippothoë</i> , 2; of <i>Pieris manni</i> and <i>P. rapae</i> , 37, 149; eggs, 70; larvæ, 70; pupæ, 71; of species of the genus <i>Lithoclellis</i> ..	86
Disappearance of <i>Fidonia conspicuata</i> ..	57
Dispersal of Coleoptera, A note on the ..	164
Distasteful butterflies rejected by birds ..	163
Distinctness (Specific) of:— <i>Acocephalus tricinctus</i> and <i>A. trifasciatus</i> , 219; <i>Anacaena limbata</i> forms, suggested ..	219
Distinguishing characters of <i>Anthocharis tagis</i> var. <i>bellezina</i> and <i>A. belia</i> , Note on ..	151
Distribution and Variation of <i>Agriades coridon</i> in the Cambridge district, Note on, 262; of <i>Depressaria putridella</i> ..	278
Drinking-habits of butterflies, 112, 159, 163, 167, 168, 198; of <i>Iphiclidies podalirius</i> , 78; of <i>Liménitis sibylla</i> ..	102
Drumming habit of larva of <i>Laertias philenor</i> ..	148
“Dusking” ..	128
Early appearance of lepidoptera, 1909, 139; (or late) of <i>Closteria reclusa</i> ..	21
Ecdyses of the “crickets,” Numerous..	9
Eggs of <i>Spilosoma mendica</i> , Small percentage of living ..	150
Emergence-time of:— <i>Fredericina calodactyla</i> , 206; <i>Hellinsia carphodactyla</i> ..	207
<i>Emmelesia blandiata</i> (<i>adaequata</i>) in Gloucestershire ..	216
Entomological Club Meetings, 22, 49, 97, 142, 219	
Entomological publications, Low appreciation of in Canada ..	239
Entomological reception at South Woodford ..	140
Entomological Society of London: Annual Meeting, 47; Changes in Council, 296; Meetings, 95; Officers for 1909-10, 50; for 1910-11 ..	302
Entomology, Photographic ..	298
<i>Erebia flavofasciata</i> , A new locality for ..	218
Erroneous records— <i>Aricia donzelii</i> not captured at Eggishorn ..	264
European occurrence of <i>Macrothylacia rubi</i> var. <i>digramma</i> ..	153
Evolution and species ..	185
Exclusiveness of <i>Dinarda pygmaea</i> ..	287
Extinction of lepidoptera ..	233
Flight of <i>Celerio gallii</i> ..	168
Flight-time of <i>Erastria venustula</i>	57
Flower-feeding rare with Kandian lepidoptera ..	161
Food of <i>Chrysoclista bimaculella</i>	220
Food-plants of <i>Amblyptilia punctidactyla</i> , 213; <i>Arctia caja</i> , 151; <i>Celastrina argiolus</i> , 150; <i>Cheimatobia brumata</i> , 180; <i>Chrysophanus dispar</i> var. <i>rutilus</i> , 13; <i>Citria cerago</i> , 56; <i>Clepsis rusticana</i> , 219; <i>Coenobius rufa</i> , 4, 109; <i>Cyaniris semiargus</i> , 132; <i>Eupithecia consignata</i> , 57; <i>E. fraxinata</i> , 237; <i>Iphiclidies ajax</i> , 114; <i>Laertias philenor</i> , 147; <i>Lasiocampa quercis</i> , 151, 187; <i>Latiorina orbitulus</i> , 122, 242; <i>Manduca atropos</i> , 234; <i>Mellinia gilvago</i> , 56; <i>Glaucoopsyche (Nomiades) melanops</i> , 61; <i>Orygia gonostigma</i> , 151; <i>Papilio machaon</i> , 15; <i>Pericallia syringaria</i> , 151; <i>Peronea cristana</i> , 44; <i>Pharetra rumicis</i> , 306; <i>Pieris manni</i> , 37, 40; <i>Psylliodes</i> , 231	
Forward habit of <i>Chrysophanid</i> larvæ, 21; Larvæ of <i>Iphiclidies ajax</i> , 114; <i>Laertias philenor</i> , 147; <i>Papilio machaon</i> ..	15
<i>Fredericina calodactyla</i> (zetterstedtii), Some notes on, (plate), 3	205
“Freeman and Lemann Collection,” presented to South London Entomological Society ..	220
Generic subdivision of the Lycaenid tribe <i>Plebeius</i> ..	107
Genitalia of <i>Evetria pinicolana</i> and <i>E. buoliana</i> compared (plate), 3	
Luperinas, 304; <i>Lycaenopsis</i> , 238; <i>Pieris rapae</i> and <i>P. manni</i> , (plate), 149; <i>Paedisca naevana</i> and <i>P. geminana</i> , 51; Rambur's use of ..	224
Giant Orneodid, A ..	219
<i>Glaucoopsyche</i> , The European species of the genus ..	130
Growth of larvæ of <i>Pieris manni</i> , Rapid ..	38, 39
Gregarious habit of larvæ of <i>Laertias philenor</i> , 146; <i>Melitaea athalia</i> ..	238
Gynandromorphic <i>Bupalus piniaria</i> , 52, 265; <i>Euchloë cardamines</i> , 123; <i>Formica sanguinea</i> , 257; Lepidoptera, Summary of Recorded, 97; <i>Lycaena arion</i> , 218; <i>Lymantria monacha</i> , 239; <i>Megachile willughbiella</i> , 219; <i>Myrmica scabrinodis</i> , 258; <i>Papilio clearchus</i> (?), 100; <i>Plebeius argus</i> , 93; <i>Saturnia</i>	

PAGE.	PAGE.
<i>parouia</i> 185	<i>bana</i> , 162; <i>Depressaria putridella</i> , 256; <i>Erebia nerine</i> , 199; <i>Lacosopis roboris</i> , 63; <i>Leptidia sinapis</i> , 119, 201; <i>Limenitis sibylla</i> , 102; <i>Tinea nigripunctella</i> 86
Gynandromorphs in the "Clark collection" 295	<i>Hecatera serena</i> , on Blackheath, 217; at West Norwood .. 234
Habit, Drinking, of butterflies, 112, 159, 163, 167, 168, 198; of <i>Iphiclides podalirius</i> , 78; of <i>Limenitis sibylla</i> 102	Historical account of <i>Depressaria putridella</i> 278
Habit, Feeding- of, <i>Iphiclides ajax</i> larvæ, 113; <i>Laertias philenor</i> , 147; <i>Odezia atrata</i> , 1; <i>Papilio agamemnon</i> , 163; <i>P. machaon</i> larvæ 14	Human element, The 140
Habit, Forward and laggard, of <i>Chrysopanoid</i> larvæ, 21; <i>Iphiclides ajax</i> , 114; <i>Laertias philenor</i> , 147; <i>Papilio machaon</i> 15	Hybernating-stage of:— <i>Argynnис laodice</i> , 97; <i>Brenthis amathusia</i> , 93; <i>B. euphydryas</i> , 291; <i>Dryas paphia</i> , 291; <i>Euvanessa antiopa</i> , 118; <i>Heliopetes carphodactyla</i> , 30; <i>Pyrameis atlanta</i> 20
Habit, Gregarious, of larvæ of <i>Laertias philenor</i> , 146; <i>Melitaea athalia</i> 238	Hybrid <i>Agriades coridon</i> \times <i>A. thetis</i> = <i>polonus</i> , Zell. (? <i>calydonius</i> , Lowe), 244, 250; <i>Anthrocera</i> , 97-99; <i>Tephrosia bistortata</i> \times <i>T. crepuscularia</i> (plate) 125
Habit, Larval, of <i>Adkinia graphodactyla</i> , 128; <i>Brenthis euphydryas</i> , 291; <i>Coenobia rufa</i> , 109; <i>Depressaria putridella</i> (plate), 276; <i>Dryas paphia</i> , 291; <i>Fredericina calodactyla</i> (plate), 206; <i>Iphiclides ajax</i> , 113; <i>Laertias philenor</i> , 146; <i>Leioptilus tephradactylus</i> , 207; <i>Melitaea athalia</i> , 238; <i>Nepticula acetosae</i> , (plate), 103; <i>Osmylus</i> , 302; <i>Peronea cristana</i> , 44; <i>Phorodesma smaragdaria</i> , 150; <i>Pieris manni</i> 39	Ichnaeumons, Liability of pupæ of <i>Papilio machaon</i> to, 16; of Pierid larvæ 226
Habit, Pairing of:— <i>Anthrocera transalpina</i> , 159; "Crickets," 9; <i>Empis opaca</i> , 189; <i>Erebia aethiops</i> , 225; <i>Leptidia sinapis</i> , 201; <i>Myrmetes piceus</i> , 288; <i>Petasia cassinea</i> , 20, 46; <i>Pieris brassicae</i> 1	Identity of <i>Charaxes zoolina</i> and <i>C. neunthes</i> 268
Habit, Resting of— <i>Callophrys rubi</i> , 188; <i>Catocala converva</i> , 64; <i>Fredericina calodactyla</i> , 2; <i>Iphiclides ajax</i> , larva, 113; <i>Laertias philenor</i> , 146; <i>Melampias melanopus</i> , 79; <i>Papilio machaon</i> , larva, 14; <i>Troides darsius</i> 161	Immigrant <i>Castnia therapon</i> , 196; <i>Sirex caudatus</i> 194
Habit, Silk-spinning of—larvæ of, <i>Iphiclides ajax</i> , 114; <i>Laertias philenor</i> , 148; <i>Papilio machaon</i> 16	Immigration of:— <i>Plusia gamma</i> , 72; <i>Pyrameis atlanta</i> , 187; <i>P. cardui</i> 188
Habit, Sleeping- of:— <i>Argynnис aglaja</i> , 113; <i>Iphiclides ajax</i> , larvæ, 114; <i>Papilio machaon</i> , larva 15	"Io-color" and "Io-form" aberration of <i>Vanessa urticae</i> , An (plate) 83
Habitats of:— <i>Chrysopanoid</i> var. <i>rutilus</i> , 13, 223; <i>Coenobia rufa</i> , 110; <i>Cocuonympha ipho-ides</i> , 63; <i>Lacosopis roboris</i> , 63; <i>Larentia olivata</i> , 180; <i>Tiliacea citrago</i> , 56; <i>Perconia boeticaria</i> var. <i>castiliaria</i> , 64; <i>Pieris manni</i> , 37	Irregularity of appearance of <i>Eugonia polychloros</i> 233
Habits of:— <i>Adkinia coprodactyla</i> , 111; <i>Araschnia levana</i> and <i>A. prorsa</i> , 204; <i>Brenthis hecate</i> , 249; <i>Coenobia rufa</i> , 110; <i>Crambus conchellus</i> , 111; <i>Danais tapro-</i>	Isle of Wight, Collecting in the .. 272
	Ivy-blossom, Captures at 293
	Laggard <i>Agriades thetis</i> 303
	Lancashire and Cheshire Entomological Society, Officers for 1909 49
	Larvæ of <i>Adkinia graphodactyla</i> , Fatality amongst wild 128
	Larvæ, Great abundance of, in 1909, 137, 139, 185, 187; lepidopterous, at Aldershot.. .. 292
	Larval habits of:— <i>Brenthis euphydryas</i> , 291; <i>Depressaria putridella</i> , 276; <i>Dryas paphia</i> var. <i>valezina</i> , 291; <i>Fredericina calodactyla</i> (plate), 206; <i>Iphiclides ajax</i> , 113; <i>Leioptilus tephradactylus</i> , 207; <i>Melitaea athalia</i> , 238; <i>Nepticula acetosae</i> , 103; <i>Osmylus</i> , 302; <i>Peronea cristana</i> , 44; <i>Pieris manni</i> .. 39
	Late appearance of <i>Anthrocera filipendulae</i> , 226; <i>Melanargia galatea</i> , 227; <i>Philogophora metiulosa</i> 76
	Lepidoptera of:—Bucks, Contribution to a list of the Macro, 285; The Dischma-Thal, 110; Ditchling district, 233; Essex, 1909,

PAGE.	PAGE.
293 The Grisons, 1, 154, 158, 166, 197, 210, 225; The Jura (spring), 118; The Tyrol .. 228	76
Lepidoptera : — Abundance of spring, 1909, 186; captured in Ross-shire, List of, 115, 176, 212; collected at Cintra, April, 1909, 153; Over-collecting of, 227; Random Notes on, 126; Recently-described forms of Palaearctic .. 259, 286	
Lepidopterist's Diary for 1908, Notes from a, 30; summer, in Central Italy, A, .. 248, 281	
Lepidopterological Notes for 1908, 53, 93; from West Cornwall, 72; observations in Ceylon in December, 160; on the Folkestone Downs 226	
Life-history of :— <i>Coenobia rufa</i> , Contributions to a (plate), 108; <i>Microdon mutabilis</i> (plate), 18; <i>Nepticula acetosae</i> , Notes on the (plate), 103; <i>Pieris rapae</i> and <i>P. manni</i> .. 37, 66, 149, 251	
Light, Lepidoptera at, 93, 127, 129, 154, 176, 212, 217, 234, 246	
Localities for :— <i>Depressaria putridella</i> (British), 278; <i>Erebia flavofasciata</i> , A new, 218; <i>Formica exsecta</i> , 257; <i>Pieris manni</i> 150	
Longevity of <i>Tinea biselliella</i> .. 220	
“Lost Pleiad, The” (<i>Holocacista rivillei</i>) refound 195	
<i>Luperina</i> , A doubtful, .. 268, 304	
Macromorphic <i>Pieris brassicae</i> .. 113	
Marsches, Collecting on .. 57, 246	
Melanic :— <i>Dryas paphia</i> , 100; <i>Lasiocampa quercus</i> larvæ, 45; <i>Melitaea deione</i> , 37; <i>Phragmatobia fuliginosa</i> , 194; <i>Phigalia pedaria</i> , 100; <i>Tueniocampa pulverulenta</i> 194	
Melanism and superficial change .. 185	
Mendelian inheritance, 98, 185; in breeding <i>Abraxas grossularia</i> 195	
Microlepidoptera, of South-West London, Notes on 86	
Micromorphic <i>Cupido minimus</i> , 220, 301; <i>Lycena aerea</i> , 53; <i>Nordmannia ilicis</i> var. <i>aesculi</i> , 63; <i>Plebeius argus</i> var. <i>alpina</i> .. 101	
Midsummer's collecting at La Granja, A 34, 62	
Migration of “Lady-birds” .. 196	
Mimetic locust 124	
Mimicry 124, 133, 204	
Mines of <i>Nepticula acetosae</i> larvæ (plate) 103	
Misunderstanding and apology .. 216	
“Mongrel” and “Hybrid,” Recognised meaning of terms 143	
Mongrelisation, of <i>Acidalia virgularia</i> , 120; of <i>Aplectia nebulosa</i> .. 76	15
Monstrous <i>Limenitis sibylla</i> .. 265	
Movements of larvæ of, <i>Cetoni floricolor</i> , 288; <i>Iphiclidies ajax</i> , 114; <i>Papilio machaon</i> 220	
Mortality amongst larvæ, ascribed to honey-dew, 233; to rain .. 233	
Müllerian (mimetic) combinations 120	
Myrmecophilous notes, for 1908, (plate), 17; for 1909, 257, 287; Coleoptera 257, 287	
Nature and Natural History .. 185	
Neurulation of <i>Trichiura ilicis</i> .. 153	
Noctuid, a doubtful 220	
Nomenclature, Binomial 242	
“Ocelliformity” 85, 212	
Orthoptera of Western Europe, Synopsis of 8, 40, 169	
Osmateria (larval) of <i>Iphiclidies ajax</i> , 115; <i>Laertias philenor</i> , 148; <i>Papilio machaon</i> 16	
Oval period of <i>Adkinia graphodactyla</i> , 127; <i>Brenthis euphrosyne</i> , 291; <i>Coenobia rufa</i> , 109; <i>Colias phicomone</i> , 292; <i>Dryas paphia</i> , 291; <i>Pieris manni</i> , 39; <i>Thalera fimbrialis</i> 296	
Oviposition of <i>Adkinia graphodactyla</i> , 127; <i>Agriades thetis</i> , 268; <i>Arctia villica</i> , 237; <i>Chrysophanus dispar</i> var. <i>rutilus</i> , 224; <i>Coenobia rufa</i> , 109, 128; <i>Dasydia obfuscata</i> , 229; <i>Dryas paphia</i> , 291; <i>Laertias philenor</i> , 148; <i>Leptidia sinapis</i> , 119; <i>Metrocampa margaritaria</i> , 291; <i>Nemeobius lucina</i> , 188; <i>Papilio polytes</i> , 161; <i>Pieris manni</i> , 38; <i>Polygonia c-album</i> , 137; <i>Tapinostola fulva</i> 124	
Over-collecting of Lepidoptera .. 227	
Pairing of <i>Anthrocera transalpina</i> , 159; <i>Empis opaca</i> , 189; <i>Erebia aethiops</i> , 225; Lepidoptera, 297, 303; <i>Myrmetes piceus</i> 288	
Pairing habit of crickets, 9; <i>Pieris brassicae</i> , 1; <i>Petasia cassinea</i> 20, 46	
Pairing-time of <i>Nyssia lapponaria</i> , 56, 93	
Palaearctic Lepidoptera, Recently described forms of .. 259, 286	
Parallelism of Species 203	
Parasites of larvæ of <i>Coenobia rufa</i> , 110; <i>Depressaria putridella</i> , 278; <i>Phytodecta pallida</i> 208	
<i>Parnus</i> , British species of the genus 189	
Photographic Entomology .. 298	
Planting of <i>Chrysophanus dispar</i> var. <i>rutilus</i> , in Wicken Fen, 154; <i>Lymantria dispar</i> , in Wicken Fen, 154; <i>Syntomis phegea</i> , in Germany (reputed) 234	
<i>Plebeiidi</i> , The generic sub-division of the Lycænid tribe 107	

PAGE.	PAGE.
Polymorphic Papilios 124	114; <i>Formica fusea</i> 287
Post-Office risks 122	Silk-spinning habit of <i>Papilio machaon</i> larva 16
Presentation of Collection to South London Entomological Society 220	Single brood of <i>Tephrosia bistortata</i> in Perthshire 125
Priority of names 143	Sluggishness of <i>Odezia atrata</i> ?, 1; <i>Papilio machaon</i> larva 15
Proportion of var. <i>valezina</i> in brood of <i>Dryas paphia</i> 291	Snow, Vegetation set back by .. 35
Protection of <i>Cassida</i> (? sp.) 275; <i>Junonia iphita</i> , 161; <i>Papilio machaon</i> (larva) 16	South-Eastern Union of Scientific Societies, The Congress of, 1909 122
Pseudo-entomology 122	South London Entomological or Natural History Society. Officers for 1909 48
Pupation of <i>Coenobia rufa</i> , 109; <i>Depressaria putridella</i> , 277; <i>Dryas paphia</i> , 188; <i>Fredericina calodactyla</i> , 206; <i>Leioptilus tephradactyla</i> (plate), 207; <i>Nepiticula acetosae</i> , 103; <i>Nola cristulalis</i> , 31; <i>Glaucopsyche (Nomia) melinops</i> , 61, 62; <i>Papilio machaon</i> , 16, 17; <i>Phytodecta pallida</i> , 208; <i>Pieris manni</i> 40, 68	Specific distinctness of <i>Eretria pinicola</i> and <i>E. buoliana</i> (plate) 3; <i>Melitaea varia</i> .. 302
Pupal armature of <i>Cnethocampa</i> 230	Specific position of <i>Macrothylacia rubi</i> var. <i>digramma</i> 153
Pupal coloration 99, 188, 303	Spiders of the Isle of Wight, additions to the list of, 276; of ants' nests 19, 288
Rain not avoided by larvae of <i>Papilio machaon</i> , 15; by moths 3	Spring butterflies of the Rhone Valley 53
Range, Restricted of <i>Argynnis nictocris</i> var. <i>nigrocaerulea</i> 186, 293	Sugar in 1907, 129; 1909 246
Rearing of <i>Alkinia graphodactyla</i> , 127; <i>Brenthis euphrosyne</i> , 291; <i>Petasia casinea</i> 58	Synonymy of <i>Aglais urticae</i> abs. (corrections) 106; <i>Coleoptera</i> (changes), 28; <i>Cupido osiris</i> , 152; <i>Depressaria putridella</i> , 221; <i>Glaucopsyche</i> , 130; <i>Polyommatus sapphirus</i> 202, 237
Reciprocal Mimicry, On 133	Synopsis of the Orthoptera of Western Europe 8, 40, 169
Resting-habits of <i>Callophrys rubi</i> , 138; <i>Catocala conversa</i> , 64; <i>Fredericina calodactyla</i> , 2; <i>Iphiclidess ajax</i> (larvae) 113; <i>Laertias philenor</i> , 146; <i>Melampias melampus</i> , 78; <i>Papilio machaon</i> (larvae) 14; <i>Troides darsius</i> 161	Temperature experiments 83
Retarded emergence in <i>Asteroecopus nubeculosa</i> 123	" <i>Tephrosia</i> tangle" revived, The .. 76, 94, 97
Retrospect of a Coleopterist for 1908 25	Teratological specimens of <i>Arctia caja</i> , 75; <i>Vanessa io</i> 268
Royal Academy Exhibition, Entomological Pictures at 144	Terminology of wing-markings of <i>Aglais urticae</i> , 5; the genitalia of lepidoptera (Rambur's use) 224; the genitalia of <i>Noctuidae</i> 89
Sales of collections—J. A. Clark, 243, 294; T. Maddison, 75; L. B. Prout, 144; Schill 51	Time of appearance of <i>Depressaria putridella</i> , 278; <i>Limenitis camilla</i> and <i>L. sibylla</i> 137
Sand-hills, collecting on 247	Type descriptions of <i>Aglais urticae</i> ab. <i>bolandi</i> , 107; ab. <i>luna</i> , 211; ab. <i>luteomarginata</i> , 107; <i>Chaetocnema arida</i> , 259; <i>Depressaria putridella</i> , 221; <i>D. putridella</i> ab. <i>esterella</i> , 254; var. <i>peucedanella</i> , 254; <i>Cupido osiris</i> , 152; <i>Polyommatus sapphirus</i> 202
Scales Normal, and Androconial, of <i>Pieris manni</i> , and <i>P. rapae</i> (plate) 149	Types of <i>Plebejid</i> genera 108
Scarcity, or absence of common species, Cause of 100	Uncertainty of scientific records .. 140
Scent of <i>Iphiclidess ajax</i> larvae .. 115	Value of study of genitalia 3, 37, 51, 224
Scents of insects not to be judged by human ideas 140	Variation in larvae and imagines (parallel) of <i>Lasiocampa quercus</i> , 45; larval markings of <i>Papilio machaon</i> , 16; size of <i>Chrysophanus disper</i> var. <i>rutilus</i> 13
Season of, Early, of 1908, 53, 77; of 1909, notes on, at Sandown, 245; Switzerland, 1908.. .. 101	Variation of <i>Agriades coridon</i> , 263; <i>Melanargia galatea</i> , 252; <i>Plebejus aegon</i> , 250, 281; <i>P. argyrognomon</i> 251
Sexual dimorphism in <i>Depressaria putridella</i> , 222; <i>Sericoris micana</i> , 236, 294	
Shyness of <i>Iphiclidess ajax</i> larva,	

PAGE.	PAGE.
Variation and distribution of <i>Agriades coridon</i> in the Cambridge district, notes on	262
Variation, Local, of <i>Erebia tyndarus</i>	79
Varieties of:— <i>Agriades coridon</i> , 299, 300; <i>Anthrocera achilleae</i> , 301; <i>Celastrina argiolus</i> , 99; <i>Cymatophora fluctuosa</i> , 267; <i>Depressaria putridella</i> , 253; <i>Eu- chelia jacobaeae</i> , 99; <i>Heodes virgaureae</i> , 301; <i>Hylophila prasinana</i> , 303; <i>Melitaea phoebe</i> , 36, 281; <i>Polyommatus icarus</i> , 281; <i>Rhodostrophia vibiciaria</i> , 66; <i>Rumiccia phlaeas</i>	301
Vertical distribution of:— <i>Crambus craterellus</i> , 64; <i>Fredericina calodactyla</i> , 111; <i>Leioptilus tephra- dactyla</i> , 111; <i>Pieris napi</i> , 118; <i>Pyrameis cardui</i> , 186; <i>Scopula alpinalis</i>	213
Wind, The operative agent in the dispersal of Coleoptera	165
Wing-markings of <i>Aglais urticae</i> , Terminology	5
Wood-boring Alucitid larvæ	96
LOCALITIES:—Aldershot, 292; Arpille, 78, 79; Asissi, 249, 251, 281; Barentritt Gorge, 155; Bembridge, 246; Bérisal, 54, 134; Berkshire, 187; Bex, 53; Birdlip, 187; Bolsena, 282; Branson, 77; Bucks, 285; Cambridge (coleoptera), 44, 231; Canceri, The, 250, 252; Ceylon, 160; Chatelard, 80; Chexbres, 53; Chislehurst, 139; Cintra, 155; Col de Balme, 79; Cornwall, West, 72; Conon Falls, 115, 176, 215; Cuxton, 138; Dauphiny, 268; Deal, 57; Dischma Thal, 110; Ditchling district (coleoptera), 43, 232; Ealing (coleoptera), 43; Eclépens, 101; Eggishorn, 264; Essex, 292; Fiesch, 264; Fiesole, 249; Findelen Cascade, 81; Finkenkrug, 223; Fluela Pass, 158; Folkestone, 226; Forclaz, 77; Frauenkirch, 155; Frenières, 53; Fürgenbaumhorn, 135; Glacier de Trient, 78; Gomagoi, 228; Gondo, 55; Gonnergrat, 82; Granchester (coleoptera), 231; Grisons, The, 1, 154, 158, 166, 197, 210, 225; Gryonne, 54; Gubbio, 281; Havel, 204; Helston, 298; Hermattje, 82; High Wycombe, 285; Isle of Elba, 95; Isle of Portland, 56; Isle of Wight, 245, 272; Italy, Central, 248, 281; The Jura, 118; Kaltwasser, Glacier, The, 135; Kandy, 160; Kincaig, 115, 176, 212; La Bátiaz, 54, 77; La Granja, 34, 62; Laquinthal, 135; Lavancher, 81; Lavey Woods, 53; Lavin, 167; Les Rappes, 78; Les Tines, 80; Llanbedrog, 93; London, S.W., 86; Lons le Saunier, 118; Newmarket, 264; Norwood, West, 234; Madingley, 231; Mapledurham, 187; Martigny, 53, 78, 100; Mexico, New, 186; Mont Esterol, 187; Morez, 118; Munster, 226; Muranza Thal, 210; Nuwara Eliya, 162; Ofen Pass, 197; Orpington, 139; Oxfordshire, 187; Pamber Forest, 187; Peradeniya, 160; Perugia, 282; Plan Achat, 80; Portugal, 137, 153; Reideralp, 264; Rhone Valley, 53; Ross-shire, 115, 176, 212; Royston Heath, 264; Ruislip, 233; Sandown, 245; St. Helen's, 246; St. Maurice, 53; Schatz Alp, 111; Schmelzboden Hoffnungsau, 155; Scilly, 28; Sertig Thal, 1; Siena, 282; Simplon Kulm, 135; Sion, 101; Southend, 93; Southsea, 138; Spello, 251; Spinabad, 155; Strela Pass, 111; Sulden Thal, 229; Sus, 166; Sussex (coleoptera), 43; Sussex Downs, 56; Switzerland, 77, 101, 134, 264; Swordale, 115, 176, 212; Teignmouth, 186, 233; Trift Gorge, 82; Trafoi, 228; Tubney, 187; The Tyrol, 228; Val d'Ema, 249; Vanelot, 79; Vernayaz, 54, 77, 101; Villars, 54; Villeneuve, 53; Wateringbury (Alucitides), 207; Wicken Fen (coleoptera), 231; Wimborne, 126; Zernetz, 197; Zmutt Valley, 81, 82.	213

LIST OF CONTRIBUTORS.

Anderson, Joseph	21, 264, 265	Burrows, (Rev.) C. R. N., F.E.S.,	
Bankes, E. R., M.A., F.E.S.	3, 4, 44, 45, 234, 236, 294	24, 150, 188	
Beare, (Prof.) T. Hudson, B.Sc., F.R.S.E., F.E.S.	25	Carlier, (Prof.) E. W., M.D., B.Sc., F.E.S.	285
Bell, James	188, 226	Chapman, T. A., M.D., F.Z.S., F.E.S.	93, 130, 132, 208, 230, 237
Bell, W., M.R.C.S., J.P.	45	Cockayne, E.A., M.A., F.E.S.	125
Bentall, E. E., F.E.S.	188	Cochrane (Miss), A.M.	118, 185, 201, 217 (twice)
Bird, C. A., F.E.S.	218	Cockerell, (Prof.) T. D. A.	186, 269, 294
Bird, J. F.	216, 235	Dadd, E. M., F.E.S.	223
Blachier, (Prof.) Charles	218	Day, F. H., F.E.S.	186
Burr, Malcolm, D.Sc., F.L.S., F.Z.S., F.E.S.	8, 40, 169	Dollman, Hereward C., F.E.S.,	

	PAGE.	PAGE.
(twice), 44, 231 (5 times), 232, 233		21
Donisthorpe, H. St. J. K., F.Z.S., F.E.S., 17, 58, 60, 136, 208, 231 (thrice), 257, 259, 272, 287		245
Editorial Notes, 45, 56, 76, 118, 126, 188, 196, 206, 216, 260, 286, 294		106, 270
Edelsten, H. M., F.E.S. ... 108, 118		137
Elliman, E. G. 33		216
Floersheim, Cecil, B.A., F.E.S., 14, 113, 146, 157, 160		236
Gibbs, A. E., F.E.S. 118		224
Gillmer, Max ... 216, 237, 259, 286		237
Goodwin, Edward, F.E.S. 46, 205, 297		Charles,
Griffiths, George, F.E.S. ... 235		M.A., F.L.S. ... 13, 20, 153
Hobbs, G. 292		24
Image, Selwyn, M.A., F.E.S. ... 24		Sharp, E. P. 265
Jackson (Miss) D. J. 115, 176, 212		Sharp, W. E., F.E.S. 164
Joy, E. C., F.E.S. ... 238, 291 (twice)		Sich, Alfred, F.E.S., 86, 103, 217, 221, 253, 276
Keynes, G. L. ... 101, 134, 262		Smith, B. Harold, F.E.S. ... 234
Keynes, J. N., M.A., D.Sc., F.E.S., 101, 134		Sperring, C. W. (A. by error), 139, 197
Lowe, (Rev.) F. E., M.A., F.E.S., 34, 62, 137		Spiller, A. J. ... 72, 293 (twice)
Mathew, (Paymaster-in-Chief) G.F., R.N., F.L.S., F.E.S. 126, 136		St. Quintin, W. H., J.P., F.E.S. 45
Mellows, Charles 187		Tatchell, Leonard ... 137, 234
Muschamp, P. A. H., F.E.S., 20, 196, 218, 227		Tetley, A. S., M.A., F.E.S. ... 53, 137
Newman, L. W., F.E.S. 185		Turner, H. J., F.E.S. 235
Ovenden, Joseph 30		Tutt, J. W., F.E.S. 1, 47, 58, 88, 93, 107, 110, 130, 137, 139, 152, 154, 158, 166, 188 (twice), 197, 202, 210, 217 (twice), 225, 228, 235, 292
Page, Rosa E., B.A. 77		Verrall, G. H., F.E.S. 154
Pease, E. G. 118		Wheeler, (Rev.) George, M.A., F.E.S., 151, 186, 205 (note), 248, 261, 281
Pearson, Douglas H. 264		Whittle, F. G. ... 93, 293 (twice)
Porritt, G. T., F.L.S., F.E.S. ... 131		
Powell, H., F.E.S. ... 37, 61, 66, 119		

LIST OF ILLUSTRATIONS, &c. (Notice to binder.)

To face PAGE.

PL. I.	Comparative view of Genitalia of <i>Everetria pinicolana</i> and <i>E. buolianana</i>	3
PL. II.	Larva, pupa, and imago of <i>Microdon mutabilis</i>	18
PL. III.	Male appendages of the species of the Genus <i>Anaspis</i>	60
PL. IV.	Larva and pupa of <i>Pieris rapae</i> and <i>P. manni</i>	66
PL. V.	<i>Aretia caja</i> ab. <i>clarki</i> , n. ab.	88
PL. VI.	Diagram of male Genitalia of Lepidoptera	89
PL. VII.	An "io-color" and "io-form" Aberration of <i>Aglais urticae</i>	83
PL. VIII.	Aberration of <i>Polygonia c-album</i>	102
PL. IX.	Life-history of <i>Nepticula acetosae</i>	103
PL. X.	Abdomen of <i>Coenobia rufa</i> ♀	108
PL. XI.	Perthshire forms of <i>Tephrosia bistortata</i>	125
PL. XII.	Hybrid <i>Tephrosia bistortata</i> and <i>T. crepuscularia</i>	125
PL. XIII.	Ancillary appendages, Androconia, and Normal Scales of <i>Pieris rapae</i> and <i>P. manni</i>	149
PL. XIV.	Pupa of <i>Fredericina calodaeta</i> , <i>in situ</i>	205
PL. XV.	<i>Depressaria putridella</i> and its allies	221
PL. XVI.	<i>Depressaria putridella</i> , details of larval habits, and pupal structure	253
Wood cut.	Aberration of <i>Abraeas grossulariata</i>	197

The Entomologist's Record and Journal of Variation.

VOL. XX.

SPECIAL INDEX.

By T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S. (Coleoptera), M. BURR, B.A., F.Z.S., F.E.S. (Orthoptera), J. E. COLLIN, F.E.S. (Diptera), and H. J. TURNER, F.E.S. (Hemiptera, Hymenoptera, Lepidoptera, etc.).

Coleoptera arranged in order of Genera. The other orders arranged by Species.

APHANIPTERA.

lætitiae, *Ornithopsylla* 241

PAGE.

hookeri	252
humile	253
hydrolapathi	253
kiesenwetteri	3, 252
livescerum	253
loti	253
marchicum	253
meliloti	253
nigritarse	252
ononis	253
opopordi	252
pisi	252
pomonae	252
pubescens	253
punctigerum	253
radiolus	252
rufirostre	252
scutellare	253
semivittatum	6
seniculum	253
spencei	253
striatum	253
subulatum	252
tenue	253
trifolii	252
ulicis	252
unicolor	253
urticarium	252
varipes	229, 252
vicite	252
vicinum	252
violaceum	253
virens	252
vorax	253
Arena octavii	6
Arhopalus fulminans	62
Aspidomorpha micans	9
Atemeles pubicollis	281
Baris analis	286
Bembidion affine	230
anglicanum	230
concinnum	230
Bledius bicornis	230
femoralis	185
Brontes	89
planatus	62, 87
Bruchus	88
Byrrhidæ	9
Bythinus glabratus	283
Callidium diuridiatum	62

COLEOPTERA.

Abdera bifasciata 229

PAGE.

Actobius villosulus 230

PAGE.

Acupalpus flavicollis 229

PAGE.

Agabus conspersus 11

PAGE.

Agraphilydrus 25

PAGE.

Agrius biguttatus 237, 268

PAGE.

Aleochara crassiuscula 241, 243,

269, 310

PAGE.

cuniculorum 34, 230

PAGE.

discipennis 2

PAGE.

fuscipes 2

PAGE.

lanuginosa 2

PAGE.

mœrens 34

PAGE.

morion 5

PAGE.

spadicea var. *procera* 34

PAGE.

succicola 34

PAGE.

Aleocharina 5

PAGE.

Anaspis garneysi 237

PAGE.

Anisodactylus binotatus var. *spur-*

caticornis 230

PAGE.

pecciloides 230

PAGE.

Anisotoma badia 293

PAGE.

flavicornis 241

PAGE.

Anisoxya fuscula 229

PAGE.

Anthicus tristis var. *schaumi* 230

PAGE.

Apbodus nitidulus 4

PAGE.

sturmi 4

PAGE.

Aphthona nigriticeps 229

PAGE.

Apion æneum 252

PAGE.

æthiops 253

PAGE.

annulipes 21

PAGE.

apricans 252

PAGE.

atomarium 252

PAGE.

bohemani 252

PAGE.

carduorum 252

PAGE.

confluens 252

PAGE.

eraccæ 252

PAGE.

dichroum 252

PAGE.

difforme 252

PAGE.

dissimile 229

PAGE.

ebeninum 253

PAGE.

ervi 253

PAGE.

filirostre 229, 253

PAGE.

fuscirostre 3

PAGE.

genistæ 252

PAGE.

gyllenhali 253

PAGE.

	PAGE.		PAGE.
Calodera nigrita	241	umbratus	7
protensa	241	Cteniopus sulphureus	5
Carabus auratus	89	var. bicolor	
Cartodere argus	3	Cyllene crinicornis	34
elongata	34	Cyrtusa minuta	293
filiformis	3	Dendrophilus pygmaeus	57, 284
Cassida obtusata	9	Dianous caerulescens	230
Cassidiidae	9	Dichirotrichus obsoletus	230
Cathormiocerus socius	230, 286	Dinarda	192
Caulotrypis æneopiceus	229	dentata	57, 282
Cerambyx heros	62	märkeli	57
Ceryxen littoralis	var. binotatum	Donacia dentipes	269
Ceuthorhynchidius posthumus	6	simplex	269
Ceuthorhynchus campestris	230	Dorytomus tremulae	6
parvulus	241	Drusilla canaliculata	57
triangulum	230	Dryops luridus	146
Cicindela campestris	8	Elmis subviolaceus	230
germanica	230	Enicmus fungicola	3, 34
Cis alni	3	rugosus	3
bidentatus	3	testaceus	3
dentatus	3	Ennearthron cornutum	34
Cistela ceramboides	237	Eryx ater	237
Clambus armadillo	293	Euplectus bescidicus	56
atomarius	293	duponti	56
minutus	293, 294	kunzei	56
punctulum	293, 294	minutissimus	6, 33, 34
Clerus formicarius	237, 268	signatus	34
Clythra	208	Exaleochara	5
quadripunctata	57, 108, 109	Gnathoncus nidicola	3
Clytus massiliensis	270	rotundatus	3
Coccinella distincta	283	Gnorimus variabilis	306
Codiosoma spedix	230	Gynandrophthalma affinis	208
Cœliodes cardui	230	Habrocerus capillaricornis	229
Collyris emarginatus	8	Haliplus fluvialis	1
Colon latum	34	innoculatus	1
Coptocycla circumdata	9	ruficollis	1
Cordylomera suturalis	34	striatus	1
Corticaria crenulata	229	Hapalaræa pygmæa	34
Cryptamorpha desjardensi	269	Harpalus æneus	286
Cryptoccephalus	208	cupreus	285, 286
aureolus	209	parallelus	230
bilineatus	209	Helophorus porculus	122
bipunctatus	208, 286	4-signatus	230
var. lineola	208, 209	Heterocerus fusculus	230
var. thompsoni	208	Hister marginatus	6
exiguus	209	Homalium pineti	34
fulvus	209	planum	34
labiatus	209	Homalota aequata	34
morei	209	boletobia	229
ochrostoma	209	divisa	229
parvulus	208, 209	exilis	34
punctiger	209	indubia	229
pusillus	209	inquinula	229
quereti	209, 237	linearis	34
sexpunctatus	209	longula	34
Cryptophynpus pulchellus	4, 7	nitidula	57
sabulicola	4, 7	pallens	34
Cryptophagus	7	parallela	283
cylindrus	6	pavens	230
dentatus	3	pilicornis	34
hirtulus	241	subtilissima	34
lovendali	147	Hydaticus transversalis	27
pallidus	3	Hydradephaga	10
scanicus	3	Hydræna angustata	2, 3
subdepressus	3	britteni	2
		longior	2

	PAGE.		PAGE.
morio	2	marinus	230
nigrita	2	punctatus	230
riparia	2	pusillus	2
Hydrobius fuscipes var. <i>æneus</i>	184	viridis	2
<i>ab. chalconatus</i>	184	Œdemera podagrariæ	270
Hydrochus nitidicollis	6	virescens	6
Hydroporus incognitus	7	Œdipoda cœruleascens	270
<i>palustris</i>	7	Olophrum alpinum	256
Hylotrupes bajulus	231	assimile	255, 256
Hypera murina	230	consimile	256
<i>tigrina</i>	6	fuseum	256
Hypnodius riparius	7	pieceum	256
Hypophloeus bicolor	34	puncticollis	256
Labidostomis	208	rotundicollis	256
<i>tridentata</i>	108, 110	Onthophilus sulcatus	6
Laccobius nigriceps	1, 44	Opatrum sabulosum	230
<i>oblongus</i>	1, 5	Orthochætes setiger	230
<i>purpurascens</i>	44	Othius myrmecophilus	57
<i>sinatus</i>	1	Oxylæmus variolosus	6, 21
Laccoptera chinensis	9	Oxypoda	230
Lathridius angulatus	229	confusa	230
Lathrimæum unicolor	256	formiceticola	56
Leptacinus formicetorum	57	hæmorrhœa	57
Leptura rubra	270	longipes	5
Limnichus pygmæus	229	metatarsalis	5
Lomechusa	88	Paracymus <i>æneus</i>	2
<i>strumosa</i>	7, 281, 282, 283	<i>nigroæneus</i>	2
Lytta vesicatoria	230	Parnus luridus	146
Magdalis duplicita	6	Passalidæ	8
Malachius barnevillii	6	Pedilophorus	9
Malthodes minimus var. <i>margini-</i>		Pelobius tardus	27
<i>collis</i>	82	Phalacrus brisouti	3, 4, 6
<i>pellucidus</i>	83	<i>brunnipes</i>	2, 3, 4
Medon castaneus	6	<i>championi</i>	2, 4
Megacronus cingulatus	237	<i>corruscus</i>	2, 3, 4
Melanopthalma fulvipes	91	<i>humberti</i>	3, 4
<i>similata</i>	6	<i>hybridus</i>	2, 4
<i>truncatella</i>	91	Philonthus <i>corruscus</i>	230
Melanotus castanipes	4, 5	cruentatus	34
<i>rufipes</i>	4, 5	Phylidrus	25
Meligethes serripes	35	<i>coarctatus</i>	25, 26, 27, 28, 29
<i>viduatus</i> var. <i>æstimabilis</i>	122	<i>maritimus</i>	25, 26, 27, 28, 29
Meloë proscarabæus	21	<i>melanocephalus</i>	25, 26, 27, 28, 29
Methydrus	25, 26	<i>minutus</i>	25, 26, 27, 28, 29
Micrambe pilosula	146	<i>nigricans</i>	25, 26, 27, 28, 29
<i>villosa</i>	146	<i>testaceus</i>	25, 26, 27, 28, 29
Micrurula melanocephala	34	Phyllolecta cavitrons	229
Monotoma conicicollis	57, 284	Phyllotreta diademata	191
<i>formicetorum</i>	57	Phymatodus lividus	215
<i>longicollis</i>	229	Phytosus balticus	6
Mordellistena parvula	229	Priobium castaneum	282
Mycetoporus angularis	237	Prionocyphon serricornis	109, 110
Myllæna brevicornis	230	Ptenidium formicetorum	57
Myrmeconia humeralis	57, 283	Pyropterus affinis	237, 269
Myrmecites piceus	57	Pytho depressus	306
Myrmidoniina	5	Quedius brevis	57
Notiophilus aquaticus	146	<i>longicornis</i>	6
<i>bigeminus</i>	146	<i>mesomelinus</i>	57
<i>hypocrita</i>	146	<i>riparius</i>	6
<i>palustris</i>	146	<i>umbrinus</i>	230
<i>pusillus</i>	146	<i>vxans</i>	6
Notothecta anceps	57	Rhizophagus coeruleipennis	6
<i>flavipes</i>	57	parallelocollis	7
Ochthebius exaratus	229	Rhynchites bacchus	87
<i>margipallens</i>	2	Rhytidosomus globulus	215

	PAGE.		PAGE.
Salpingus ater ..	229	scalare, Melanostoma ..	269
Sibinia arenariæ ..	230	Scenopinidæ ..	45
Silpha tristis ..	230	spinigera, Phora ..	218, 241
Silvanus similis ..	34	Stratiomyidæ ..	45
Simplocaria metallica ..	5	Syrphidæ ..	45
picipes ..	5	Tabanidæ ..	45, 69
semistriata ..	5	Therevidæ ..	45
Sitones cambrieus ..	229	unguicella, Anthomyza ..	147
waterhousei ..	230	univittata, Pegomyia ..	147, 187
Stenus latifrons ..	230		
Stomis pumicatus ..	230		
Strachia ornata ..	270		
Sunius augustatus ..	241		
lyonessius ..	241		
Taphria nivale ..	230		
Tetropium crawshayi ..	5		
gabrielli ..	5, 9		
Thiasophila angulata ..	57		
Thinobius longipennis ..	34		
Throscus obtusus ..	229		
Trichius fasciatus ..	270		
Trichonyx sulcicollis ..	6		
Trichodes apicarius ..	270		
Trogolinus anglicanus ..	230, 268		
Trogophleus bilineatus ..	230		
Tropidères sepicola ..	21		
Xantholinus atratus ..	57		
cribripennis ..	184		
distans ..	148, 184		
COLLEMBOLA.			
tullbergi, Anurida ..	33		
DIPTERA.			
albicans, Phora ..	218	abbreviator, Spilocryptus ..	35
armillata, Amaurosoma ..	147	agra, Cælioxys ..	241
Asilidæ ..	7, 45	albipes, Technomyrmex ..	71
atramentaria, Rhinophora ..	231, 269	albitarse, Polynema ..	106
bicornis, Agromyza ..	241	alienus, Lasius ..	90
Bombyliidæ ..	45	alluardi, Plagiolepis ..	71
campestris, Phora ..	218, 241	Antæon ..	101
Cyrtidae ..	45	alorus (azorus), Antæon ..	101
dubitalis, Phora ..	218	anthracinus, Pezomachus ..	284
emarginata, Phora ..	218	Apanteles ..	284
esuriens, Pegomyia ..	147	aprilinus, Neuroterus ..	210
flavipes, Pegomyia ..	187	Aptesis ..	35
fuscinervis, Phora ..	218, 241	aquigranensis, Pezomachus ..	284
inerme, Amaurosoma ..	147	arvensis, Mellinus ..	231
inornata, Diastata ..	147	assimilis, Phygadeuon ..	36
intermedia, Phora ..	241	atricapillus, Cremnodes ..	35
Leptidae ..	45	auropunctata, Wasmannia ..	71
livida, Empis ..	218	azorus (=alorus), Antæon ..	101
melanocephala, Phyto ..	231, 269	Bethylidæ ..	100
microps, Ectoptomera ..	241	Bethylinae ..	100
Muscidae ..	69	Bethyli ..	101
nitida, Hyadina ..	241	bilineatus, Meniscus ..	24, 71
paludosa, Phora ..	218, 241	boerorum, Ponera ..	71
Phora sp. ..	268	brachypterus, Microcryptus ..	36
Pipunculidæ ..	45	Braconidæ ..	284
Platypezidae ..	45	brevicornis, Lasius ..	282
quadrivittata, Sapromyza ..	147	cæciliæ, Prenolepis ..	71
radiata, Brachypeza ..	147	castaneus, Oresbius ..	36
retroversa, Phora ..	218, 241	Cephalonomia ..	100, 101
rufa, Phora ..	218	cephalotes, Bethylus ..	101
		Ceraphron ..	106
		Ceraphronidæ ..	100
		Ceraphroninæ ..	101
		Chalcididae ..	69, 100, 284
		Chorebus ..	284
		Chrysidide ..	100
		cinerea, Formica ..	90

HEMIPTERA.

acuminata, Allia ..	231
alienum, Cryptostemma ..	305
Aphis ..	281
boops, Nabis ..	269
contractus, Notochilus ..	267
denticulata, Coreus ..	231
hamulatus, Notochilus ..	267
inearnatus, Piezodorus ..	231
punctipes, Metacanthus ..	231
quadrivirgatus, Miridius ..	231
ornata, Strachia ..	270
rubidus, Orthotylus ..	231
scurra, Idiocerus ..	243, 269

HYMENOPTERA.

abbreviator, Spilocryptus ..	35
agra, Cælioxys ..	241
albipes, Technomyrmex ..	71
albitarse, Polynema ..	106
alienus, Lasius ..	90
alluardi, Plagiolepis ..	71
Antæon ..	101
alorus (azorus), Antæon ..	101
anthracinus, Pezomachus ..	284
Apanteles ..	284
aprilinus, Neuroterus ..	210
Aptesis ..	35
aquigranensis, Pezomachus ..	284
arvensis, Mellinus ..	231
assimilis, Phygadeuon ..	36
atricapillus, Cremnodes ..	35
auropunctata, Wasmannia ..	71
azorus (=alorus), Antæon ..	101
Bethylidæ ..	100
Bethylinae ..	100
Bethyli ..	101
bilineatus, Meniscus ..	24, 71
boerorum, Ponera ..	71
brachypterus, Microcryptus ..	36
Braconidæ ..	284
brevicornis, Lasius ..	282
cæciliæ, Prenolepis ..	71
castaneus, Oresbius ..	36
Cephalonomia ..	100, 101
cephalotes, Bethylus ..	101
Ceraphron ..	106
Ceraphronidæ ..	100
Ceraphroninæ ..	101
Chalcididae ..	69, 100, 284
Chorebus ..	284
Chrysidide ..	100
cinerea, Formica ..	90

	PAGE.		PAGE.
Conostigmus ..	101, 106	nitidulus, Formicoxenus ..	56, 192
contracta, Ponera ..	283	noctilio (s), Sirex ..	19, 63, 91
Cremnodes ..	35	nylanderi, Leptothorax ..	282
Cryptinæ ..	34	Obisiphaga ..	35
Cynipidæ ..	100	obsecuricornis, Antæon ..	101
divisus, Antæon ..	101	Oresbius ..	34, 35
donisthorpei (fumipennis <i>var.</i>),		Oxyura ..	99, 100
Exallonyx ..	106	palidus, Lagynodes ..	57, 106
Dryininae ..	100, 101	panzeri, Notozus ..	215
Emboleminæ ..	100	paradoxus, Apterophygas ..	35
Epyris ..	101	paradoxus, Cremnodes ..	35
erraticum, Tapinoma ..	282	Parasitica (Tarabrantia) ..	100
erythromena, Spalangia ..	284	parvus (parvulus), Antæon ..	101
falcatus, Apanteles ..	284	pedestris, Hemiteles ..	36
fasciatus, Rhabdepyris ..	101	Pezomachidæ ..	284
flava, Formica ..	90	Pezomachus ..	35
flavipes, Prenolepis ..	71	Phygadeuon ..	35
flavus, Lasius ..	90, 231, 281, 282	Phygadeuonini ..	35
formicarum, Ceraphora ..	106	Platygaster ..	106
Formicidæ ..	281	Ponera ..	71
fugax, Solenopsis ..	231, 282	Pristoura ..	101
fuliginosus, Lasius ..	57, 106, 282, 284	procerus, Phygadeuon ..	36
fulveolatus, Spinola ..	35	Proctotrypidæ ..	99, 100
fumipennis, Exallonyx ..	106	Pseudoisobrachium ..	101
fusca, Formica ..	56, 281	punctatissima, Ponera ..	71
fusicornis, Bethylus ..	100	punctulatus, Conostigmus ..	101
fuscorufibarbis (rufibarbis <i>var.</i>),		rogeri, Strumigenys ..	71
Formica ..	231, 281	rottundipennis, Phygadeuon ..	36
Gonatoppi ..	101	rufa, Formica ..	19, 56, 57, 90, 106,
Goniozus ..	101		108, 192, 281, 282, 283, 284
gravenhorsti, Phygadeuon ..	36	rufibarbis, Formica ..	231, 281
graviceps, Microcryptus ..	36	rufipes, Mutila ..	231
grisescens, Plectocryptus ..	35	ruginodis, Myrmica ..	106, 284
Habropelta ..	101	Saladerma ..	101
heinemanni, Phygadeuon ..	35	sanguinea, Formica ..	56, 57, 63,
hemipterus, Hemiteles ..	36		119, 192, 281, 283
Hemiteles ..	36	scabrinodis, Myrmica ..	56, 106, 284
hopei (abbreviator <i>var.</i>), Spilo- ..		Scelioninæ ..	101
cryptus ..	35	schlechtendali, Neuroterus ..	210
hyalinalis, Bethylus ..	101	simillimum, Tetramorium ..	71
Ichneumoninæ ..	47	Sirex ..	63, 92
ichneumonoides, Methoca ..	231	Sirices ..	63
incubitor, Spilocryptus ..	35	sociabilis (wasmanni <i>var.</i>), Exal-	
indivisus, Antæon ..	101	lonyx ..	106
juvencus, Sirex ..	19, 63, 91, 92, 215, 243	Spalangia ..	284
labralis, Microcryptus ..	36	Spilocryptus ..	35
lævinodis, Myrmica ..	284	striatidens, Triglyphothrix ..	71
Lagynodes ..	101	Strumigenys ..	71
longicornis, Prenolepis ..	71	subzonatus, Hemiteles ..	36
longulus, Halictus ..	241	sulcinodis, Myrmica ..	56
Megaspilini ..	101	Tarabrantia (= Parasitica) ..	100
Megaspilus ..	101	Thaumatomotypus ..	35
malachurus, Halictus ..	241	triareolatus, Perisemus ..	100
marshalli, Phygadeuon ..	36	truncatellus, Litomastix ..	69
Microcryptus ..	35, 36	variabilis, Phygadeuon ..	36
micropterus, Microcryptus ..	36	viator, Accilius ..	284
migrator, Spilocryptus ..	35	vividula, Prenolepis ..	71
mullensis, Conostigmus ..	101	wasmanni, Exallonyx ..	106
Myrmidæ ..	100		
Myrmica ..	281		
neesi (aquisgranensis <i>var.</i>), Pezo-			
machus ..	284		
niger, Lasius ..	90, 231, 281, 282, 284		
nigricornis, Antæon ..	101		
nigrocinctus, Microcryptus ..	36		

LEPIDOPTERA.

abietella, Dioryctria ..	210, 211
abjecta, Mamestra ..	13
Abraxas (= Phalaena) ..	205
abruptaria, Hemerophila ..	12, 61, 84, 145
absynthiata, Eupithecia ..	20, 270

PAGE.	PAGE.
acaciæ, Nordmannia (Thecla) 177, 178	alopecurus (rurea ab.), Xylophasia 17, 42
acanthodactyla (punctidactyla),	alpicola (alpina by error), Malaco- soma 207, 273
<i>Amblyptilia</i> 222	alpina, Pachnobia 12, 285
aceriana, <i>Hedya</i> 216	alpina (phœbe var.), <i>Melitaea</i> 105
aceris, <i>Apatela</i> 119, 192, 216	alpinalis, <i>Scopula</i> 208, 274
acetosæ, <i>Nepticula</i> 242, 248-252, 271	althæa, <i>Erynnis</i> 178
achatinella, <i>Nyctegretis</i> 64	alveus, <i>Hesperia</i> 98, 107, 126, 137, 149, 193, 194, 207, 221
achilleæ, <i>Anthrocera</i> 73, 74, 78, 86, 93, 185, 208, 273	amanda, <i>Polyommatus</i> 77, 78, 177, 300
achilleæ (ioniceræ ab.), <i>Anthrocera</i> 49	amataria, <i>Timandra</i> 228, 298
Acidaliinæ 128	amathusia, <i>Brethis</i> 50, 54, 98, 125, 126, 138, 139, 149, 150, 194, 205, 226, 280, 301
acis, <i>Lycæna</i> see semiargus, <i>Cyaniris</i>	ambiguous, <i>Scoparia</i> 186
acteon, <i>Thymelicus</i> 180, 279	amoena (strigilis ab.), <i>Miana</i> 121
adippe, <i>Argynnис</i> 24, 139, 192, 221, 222, 226, 228, 279, 284	amyntas, <i>Everes</i> see argiades, <i>Everes</i>
adippellus, <i>Crambus</i> 278	amyntula (argiades var.), <i>Everes</i> 148
Adkinia 49	andrenæformis, <i>Egeria</i> (Trochilium) 11, 24, 71, 148, 187, 270
Adopæa 16	andromedæ, <i>Hesperia</i> 207
adrasta (mæra var.), <i>Pararge</i> 177, 178, 180	angularia, <i>Ennomos</i> 61
adustata, <i>Lygdia</i> 30	angustalis (erigatus), <i>Cledeobia</i> (Botys) 141, 142
advena, <i>Aplecta</i> 297	angustiorana, <i>Batodes</i> 210
advenella, <i>Rhodophæa</i> 298	anomala, <i>Stilbia</i> 11
agon (=argus), <i>Plebeius</i> 90, 98, 116, 126, 140, 148, 180, 309	Anthrocera (Zygæna) 24, 185, 208, 218, 273
ællo, <i>Oeneis</i> 300	antiochena (achilleæ var.), <i>Anthro- cera</i> 74
æscularia, <i>Hybernia</i> 61	antiopa, <i>Euvanessa</i> 54, 76, 78, 243, 247, 278, 279, 284
æsæculiæ (pyrina), <i>Zeuzera</i> 210, 211	antiqua, <i>Orgyia</i> 210, 211
æstiva (boeticus var.), <i>Lampides</i> 140	apicata, <i>Larentia</i> 208
æstivaria, <i>Hemithea</i> 128, 129, 130, 131, 133, 134	apiciaria, <i>Epione</i> 61, 298
ætherea (phœbe var.), <i>Melitea</i> 106, 169, 170, 171	apiforme, <i>Trochilium</i> 12
æthiops, <i>Erebia</i> 125, 127, 136, 137, 138, 206, 221, 243, 279, 280	apollo, <i>Parnassius</i> 77, 78, 91, 97, 107, 125, 127, 137, 138, 149, 172, 173, 174, 176, 221, 270
æfinis, <i>Cosmia</i> 297	apriliina, <i>Agriopsis</i> 20, 24
agathina, <i>Agrotis</i> 271	arcania, <i>Cænonymphia</i> 107, 127, 137, 149, 150, 177, 178, 180, 193, 300
aglaia, <i>Argynnис</i> 97, 107, 125, 126, 137, 138, 148, 149, 150, 192, 193, 194, 205, 226, 243, 248, 266, 273, 280, 310	arcas, <i>Lycæna</i> 278, 280
Aglossa 141	archippus (erippus var.), <i>Anosia</i> 237, 238, 243
agrorum, <i>Marasmarcha</i> 52, 53	Arctia 172
alba (myrmidone ab.), <i>Colias</i> 192	arcuatella, <i>Nepticula</i> 45
albicillata, <i>Melanthia</i> 30	areuosa, <i>Chortodes</i> 297
albicosta, <i>Coleophora</i> 105	areola, <i>Xylocampa</i> 29
albipunctata, <i>Eupithecia</i> 12	argentula, <i>Bankia</i> 296
albipuncta (orbitulus var.), <i>Poly- ommatus</i> 274	argiades (amyntas), <i>Everes</i> 77, 78- 81, 90, 96, 116, 148, 176, 180, 231-237, 264, 265, 301-305
albistrigalis, <i>Hypenodes</i> 227, 297	argianus (=semiargus), <i>Cyaniris</i> .. 183
albulalis, <i>Nola</i> 310	argiolus, <i>Celastrina</i> 29, 44, 75, 77, 78, 79, 89, 116, 120, 123, 147, 172, 178, 183, 237, 270, 279, 305, 310
alceæ, <i>Erynnis</i> 76, 78, 177	argus (ægon), <i>Plebeius</i> 77, 78, 90, 98, 116, 125, 126, 127, 140, 148, 149, 180, 193, 194, 207, 309
alceatas (=coretas), <i>Everes</i> 77, 78, 79-81, 148, 176, 231-237, 264, 265, 266, 302, 305	alni, <i>Jochæara</i> 285
alciphron, <i>Loweia</i> (Chrysophanus) 54, 127, 136, 137, 177, 192, 300	alniaria, <i>Ennomos</i> 61
alcon, <i>Lycæna</i> 55, 278, 279, 280, 301	
alecyone, <i>Hipparchia</i> 54, 55, 187, 188	
alexandræ, <i>Troides</i> 71	
alexis, <i>Polyommatus</i> see <i>icarus</i> , <i>Polyommatus</i>	
alni, <i>Jochæara</i> 285	
alniaria, <i>Ennomos</i> 61	

PAGE.	PAGE.
argus (=argyrogномон), <i>Plebeius</i> 54, 76, 77, 78, 90, 98, 149, 193, 207, 218, 222, 234	barrettii, <i>Luperina</i> 285
argyrogномон, <i>Plebeius</i> <i>see argus</i> , <i>Plebeius</i>	basilinea, <i>Apamea</i> 64
arion, <i>Lycena</i> 55, 98, 107, 116, 125, 126, 127, 137, 138, 149, 172, 221, 271, 278, 280, 300, 301	basistrigalis, <i>Scoparia</i> 64
armigera, <i>Heliothis</i> .. 119, 285	batis, <i>Thyatira</i> 227, 309
arragonensis (achilleæ var.), <i>Anthro-</i> <i>throcea</i> 74	baton, <i>Scolitantes</i> 176, 177, 300
arundinea, <i>Nonagria</i> <i>see neurica</i> , <i>N.</i>	bellargus, <i>Agriades</i> 70, 71, 75, 77, 78, 90, 116, 173, 177, 178, 207, 221, 234, 236, 243
arundinis (typhæ), <i>Nonagria</i> 289, 290, 296	bellidice (daplidice var.), <i>Pieris</i> 178, 180
arundinis, <i>Phragmatocia</i> .. 295, 296	bellis (achilleæ var. et ab.), <i>Anthro-</i> <i>cera</i> 74
asella, <i>Heterogenea</i> 13	bembeciforme, <i>Trochilium</i> .. 210
ashworthii, <i>Agrotis</i> 148	benetii, <i>Agdistis (Adactyla)</i> .. 187
asiatica, <i>Marasmarcha (Platyptilia)</i> 52, 53	berberata, <i>Anticlea</i> 298
assimilella, <i>Depressaria</i> 210	bergmanniana, <i>Dictyopteryx</i> .. 242
asteria, <i>Melitaea</i> 301	berisalensis (deione var.), <i>Melitaea</i> 54, 76, 78, 172, 300
asteris, <i>Cucullia</i> 272	betulae, <i>Ruralis</i> 162, 182, 183, 279, 310
asterias, <i>Papilio</i> 255	betularia, <i>Amphidasys</i> 41, 61, 84, 85, 217, 242, 309
astrarche, <i>Aricia (Chrysophanus)</i> 21, 77, 78, 90, 98, 107, 116, 125, 126, 137, 176, 194, 222	betulella, <i>Coleophora</i> 105
atalanta, <i>Pyrameis (Vanessa)</i> 19, 40, 41, 172, 186, 192, 246, 254, 278	bicolorata, <i>Melanthia</i> 30
Atella 22	bicolorella, <i>Coleophora</i> 23, 105
athalia, <i>Melitaea</i> 50, 54, 78, 98, 107, 125, 126, 136, 138, 149, 172, 177, 178, 193, 195, 280, 301	bicostella, <i>Pleurota</i> 64
atlanticus (ocellata var.), <i>Smerin-</i> <i>thus</i> 203	bicuspis, <i>Dicranura</i> 24, 242, 285, 310
atomaria, <i>Ematurga</i> 12, 17, 29, 61, 248	bidentata, <i>Odontopera (Gonodontis)</i> 12, 23, 61, 121, 146
atrata, <i>Odezia (Tanagra)</i> 192, 217, 222-225, 260, 264, 271	bifida, <i>Dicranura</i> 119, 310
atrebatensis (urticæ ab.), <i>Aglais</i> .. 24	bilinea (trigrammica ab.), <i>Gram-</i> <i>mesia</i> 271
atropos, <i>Manduca</i> 239, 296	bilineata, <i>Campptogramma</i> 30, 62, 243, 271
Attacides 120	bilunaria, <i>Selenia</i> 61
aurantiaria, <i>Hybernia</i> 29	binaria, <i>Drepana</i> 205
aurelia, <i>Melitaea</i> 55, 77, 78	Binghamia 302
auricoma, <i>Pharetra</i> 285	bipunctaria, <i>Eubolia</i> 107, 127, 221
auriflua, <i>Porthesia</i> <i>see similis</i> , <i>P.</i>	bipunctidactyla, <i>Adkinia</i> 175, 187, 299
aurinia, <i>Melitaea</i> 24, 29, 68, 76, 77, 78, 179, 301, 310	bisetata, <i>Acidalia</i> 61, 119
aurita, <i>Setina</i> 98, 126, 137, 149, 195, 208	Biston (=Dasyphara) 205
auroraria, <i>Hyria</i> 23	bistortata, <i>Tephrosia</i> 64, 240
austauti (populi var.), <i>Amorpha</i> 173, 203	Bithys 183
australis, <i>Aporophyla</i> .. 238, 243	bitorquata (achilleæ var. et ab.), <i>Anthrocera</i> 74
autumnaria, <i>Ennomos</i> .. 64, 68	biundularia, <i>Tephrosia</i> <i>see crepus-</i> <i>cularia, T.</i>
autumnata (aria), <i>Oporobia (Epir-</i> <i>rita)</i> 29, 30, 67, 68	boeticus, <i>Lampides</i> 44, 89, 116, 123, 139-141, 159, 160, 162, 173, 180, 182, 183, 304, 305
aversata, <i>Acidalia</i> 61, 119, 186	bombyliformis (=tityus), <i>Hemaris</i> 128
badiana, <i>Argyrolecia</i> 91, 92	bondii, <i>Tapinostola</i> <i>see morrisii</i> , <i>T.</i>
badiata, <i>Anticlea</i> 192	boreata, <i>Hybernia</i> 20, 29
bætica, <i>Oenogyna</i> 69	boreata, <i>Electra</i> 143
bajularia, <i>Phorodesma</i> <i>see pustu-</i> <i>lata</i> , <i>P.</i>	Botys 141
baliodactyla, <i>Wheeleria</i> <i>see nivei-</i> <i>dactyla</i> , <i>Merrifieldia</i>	bractæa, <i>Plusia</i> 30
	brassicæ, <i>Pieris</i> 19, 69, 78, 173, 193, 207, 239, 246, 254, 273, 309, 310
	brevilinea, <i>Leucania</i> 271, 307
	briomartis, <i>Melitea</i> 70
	brizella, <i>Gelechia</i> 100
	brumata, <i>Hybernia</i> 20, 29, 61, 210
	brunnea, <i>Noctua</i> 227
	brunneata, <i>Fidonia</i> 193
	bucephala, <i>Pygæra</i> 210, 211, 296
	Buckleria 53, 69

PAGE.	PAGE.
buoliana, <i>Retinia</i> 64, 210	ceto, <i>Erebia</i> 55, 150, 300
Bupalus (= <i>Phaophyga</i>) 205	chaonia, <i>Drymonia (Notodonta)</i> 13, 68
burekharti (lippei) <i>hybr.</i> , <i>Phryxus</i> 204, 311	Chattendenia (Edwardsia) 143,
cæca (hyperanthus <i>ab.</i>), <i>Aphantopus (Enodia)</i> 222, 270	160, 182, 183
cæca (= <i>impunctata</i>) (<i>satyrium ab.</i>), <i>Cœnonymphpha</i> 207	chelys (xanthomelas <i>ab.</i>), <i>Eugonia</i> 172
cæruleccephala, <i>Diloba</i> 20, 243	chi, <i>Polia</i> 18, 20, 272, 285
cæruleopunctata (<i>phreteres ab.</i>), <i>Polyommatus</i> 301	chimæra, <i>Ornithoptera</i> 172
cæruleoscens (<i>viridata ab.</i>), <i>Nemoria</i> 132, 133	chlorana, <i>Earias (Halias)</i> 96, 214, 296
cæsiata, <i>Larentia</i> 17, 18, 29, 107, 208, 221	Chloridea (<i>Heliothis</i>) 119
cæspitiella, <i>Coleophora</i> 105	christiernana, <i>Hypercallia</i> 208
cagnagellus, <i>Hyponomeuta</i> 185, 186, 216, 238	christyi, <i>Oporabia</i> 30
caia, <i>Arctia</i> 86, 243, 295	chrysidiiformis, <i>Ægeria</i> 24
c-album, <i>Polygonia</i> 22, 23, 36, 75, 78, 125, 172, 178, 278, 309, 310	chrysitis, <i>Plusia</i> 30, 296
callidice, <i>Pieris</i> 178	chrysonuchellus, <i>Crambus</i> 64, 242
Callophryidi 182, 183	Chrysophaninae 183
Callophrys 182, 183	Chrysophanidi 183
calluna (quercus <i>var.</i>), <i>Lasiocampa</i> 133	Chrysophanus 181, 182, 183
camelina, <i>Odontosia (Lophopteryx)</i> 253	chrysorrhœa, <i>Porthesia</i> 188
camilla, <i>Limenitis</i> 172, 177, 192, 222	cilialis, <i>Nascia</i> 295, 299
Camprea (= <i>Tribacis</i>) 205	Cilix 205
candida (cribrum <i>var.</i>), <i>Emydia</i> .. 195	cinerea, <i>Agrotis</i> 271
carbonifera, <i>Miselia</i> 94	cinerella, <i>Brachycrossata</i> 64
cardamines, <i>Euchloë</i> 75, 78, 177, 271	cinxia, <i>Melitaea</i> 76, 77, 78, 172, 177
cardui, <i>Pyrameis</i> 19, 41, 75, 78, 97, 122, 172, 304	circe, <i>Satyrus</i> 54
carmelita, <i>Lophopteryx</i> 13	clathrata, <i>Strenia</i> 298
canea (nicæa <i>var.</i>), <i>Hyles</i> 173	cleodoxa (adippe <i>ab.</i>), <i>Argynnис</i> .. 222
carniolica, <i>Anthrocera</i> 74, 93, 97, 126, 138, 172	cleodoxa-fulvescens (adippe <i>ab.</i>), <i>Argynnис</i> 222
carphodactyla, <i>Hellinsia</i> 18, 145, 186, 187	cleopatra, <i>Gonepteryx</i> 86
carpini, <i>Saturnia</i> 67, 70, 192	cloacella, <i>Tinea</i> 105
earthami, <i>Hesperia</i> 77, 78, 176, 177	cloraria (<i>viridata</i>), <i>Nemoria</i> 129, 132
cassiope (epiphron <i>var.</i>), <i>Erebia</i> .. 179	clymene, <i>Pararge</i> 192
castigata, <i>Eupithecia</i> 30	clymene (atalanta <i>ab.</i>), <i>Pyrameis</i> 172
castissima (nicæa <i>var.</i>), <i>Hyles</i> 173	celestis (bellargus <i>ab.</i>), <i>Agriades</i> .. 70
Castnia 15	Cœnonymphpha 127
castrensis, <i>Malacosoma</i> 64, 70, 192, 243, 270, 271	cenosa, <i>Lælia</i> 285
Catocala 93, 172	Coleophora 163, 211
Catopsilia 22	colonum (sociella), <i>Botys</i> 141, 142
catulla, <i>Catopsilia</i> 148	colossa, <i>Marasmarcha</i> 52, 53
caucasica, <i>Melitaea</i> 170	combusta (rurea <i>ab.</i>), <i>Xylophasia</i> .. 42
Celastrina 182, 183	comes, <i>Triphaena</i> 29, 309
Celastrinidi 183	comitata, <i>Pelurga</i> 62, 121
celerio, <i>Hippotion</i> 284	comma, <i>Leucania</i> 297
centaureata, <i>Eupithecia</i> see oblongata, E.	comma, <i>Urbicola</i> 24, 138, 193, 194, 207, 221, 274
cerago, <i>Citria (Xanthia)</i> see fulvago, C.	comparella, <i>Lithocletis</i> 105
cereola, <i>Lithosia</i> 221	compta, <i>Dianthœcia</i> 285
cerisy, <i>Thaïs</i> 70	comyntas (<i>argiades var.</i>), <i>Everes</i> 90, 304
ceronus (bellargus <i>ab.</i>), <i>Agriades</i> 173, 178	concavilinea (<i>viridaria ab.</i>), <i>Nemoria</i> 132, 133
cerri (ilicis <i>ab.</i>), <i>Thecla</i> 177, 178	conchellus, <i>Crambus</i> 49, 208, 274
certata, <i>Scotosia</i> 298	concinnata, <i>Dysstroma</i> 143
cespitis, <i>Luperina</i> 272	concinnata (russata <i>var.</i>), <i>Polyphasia (Cidaria)</i> 143
	confluens (= <i>achilleæ</i>) (<i>loniceræ ab.</i>), <i>Anthrocera</i> 49
	confusa (<i>phœbe ab.</i>), <i>Melitaea</i> 96
	confusalis, <i>Nola</i> 30
	conigera, <i>Leucania</i> 297
	conjuncta (<i>daphne ab.</i>), <i>Brenthis</i> .. 172
	consolidata (russata <i>var.</i>), <i>Cidaria</i> .. 143
	consonaria, <i>Tephrosia</i> 148
	conspicillaris, <i>Xylomiges</i> 285
	conspersa, <i>Dianthœcia</i> 30

PAGE.	PAGE.
conterminella, <i>Depressaria</i> .. 210	damon, <i>Polyommatus</i> .. 55, 90
continuata (montanata <i>ab.</i>) ..	daphne, <i>Brenthis</i> 172, 227, 300
<i>Larentia</i> 121	daplidice, <i>Pieris</i> 54, 76, 77, 78, 121, 178, 180
conversa, <i>Catocala</i> 93	darwiniana (arcania <i>var.</i>), <i>Cœnonymphpha</i> 107, 127, 137, 149, 150, 193, 300
conversaria (repandata <i>ab.</i>), <i>Boar-</i> <i>mia</i> 122, 271, 272	darwiniana <i>mongr.</i> , <i>Smerinthus</i> 203
convolvuli, <i>Agrius</i> 284	Dasyphara 205
coproductyla, <i>Adkinia</i> 195, 207, 208, 275, 281	daubii <i>hybr.</i> (= <i>hybridus</i>), <i>Smerin-</i> <i>thus</i> 203
cordula, <i>Satyrus</i> 55	davus, <i>Cœnonymphpha</i> <i>see</i> <i>tiphon</i> , <i>C.</i>
coretas, <i>Everes</i> <i>see</i> <i>alcetas</i> , <i>E.</i>	debiliata, <i>Eupithecia</i> .. 12, 13
coronata, <i>Eupithecia</i> 12, 13, 30, 119	decolor (<i>argiades ab.</i>), <i>Everes</i> .. 265
corticea, <i>Agrotis</i> 228	decolorata (<i>alcetas ab.</i>), <i>Everes</i> 78, 80, 235, 236, 265, 266
corydon, <i>Agriades (Polyommatus)</i> 20, 49, 55, 90, 97, 98, 107, 114, 116, 117, 125, 126, 136, 137, 138, 149, 150, 172, 173, 178, 180, 193, 194, 207, 221, 222, 236, 240, 270, 271, 280	decora (<i>apollo ab.</i>), <i>Parnassius</i> .. 174
corydonius (<i>corydon var.</i>), <i>Agri-</i> <i>ades</i> 178, 180	defoliaria, <i>Hybernia</i> .. 20, 61, 210
corylata, <i>Cidaria</i> 12, 13	deione, <i>Melitaea</i> 54, 76, 78, 172, 177, 178, 180
Cossus 15	delamerensis (<i>biundularia var.</i>), <i>Tephrosia</i> 84, 85, 272
costæstrigalis, <i>Hypenodes</i> 297	deleta (= <i>metis ab.</i>), <i>Smerinthus</i> .. 203
costai (<i>atrata var.</i>), <i>Odezia</i> 222, 224	delius, <i>Parnassius</i> 207, 270
costalis, <i>Pyralis</i> 299	demodocus, <i>Papilio</i> 22
costovata (<i>fluctuata ab.</i>), <i>Melanippe</i> 24, 62	densoi <i>hybr.</i> , <i>Phryxus</i> 204
coulonellus, <i>Crambus</i> 274	dentalis, <i>Odontia</i> 186
crabroniformis, <i>Trochilium</i> (Ægeria) 11, 12, 192	deplana, <i>Lithosia</i> 296
cratægata, <i>Rumia</i> 61, 86	depuncta (<i>argiades ab.</i>), <i>Everes</i> 80, 265
cratægi, <i>Aporia</i> 24, 64, 65, 75, 77, 78, 125, 145, 149, 176, 186, 270	derasa, <i>Gonophora</i> 227
cratægi, <i>Trichiura</i> 20, 270, 271	deserticola (<i>euphorbiæ var.</i>), <i>Hyles</i> 173
crepuscularia (<i>biundularia</i>), <i>Teph-</i> <i>rosia</i> 29, 84, 85, 240, 272	designata, <i>Coremia</i> 30
creshpontes, <i>Heraclides (Papilio)</i> 255	dextroalbescens (<i>jurtina ab.</i>), <i>Epinephele</i> 221
cretica (<i>cerisyi ab.</i>), <i>Thaïs</i> 70	dia, <i>Brenthis</i> 54, 75, 78, 138, 139, 226
cribralis, <i>Herminia</i> 297	dictæa, <i>Leiocampa</i> 18
cribrum, <i>Einydia</i> 195	dictynna, <i>Melitaea</i> 50, 70, 77, 78, 99, 107, 137, 150, 175, 178, 179, 207, 248, 280, 301
crinanensis, <i>Hydroœcia</i> 146, 184	didyma, <i>Apamea</i> 30
cristatella, <i>Bucculatrix</i> 64	didyma, <i>Melitaea</i> 77, 78, 98, 125, 126, 136, 137, 138, 149, 171, 177, 193, 194
cristulalis, <i>Nola</i> 213	didymata, <i>Larentia</i> 12, 20, 29
crocealis, <i>Ebulea</i> 299	dictæa, <i>Catocala</i> 93
cruciana, <i>Hyperœcia</i> 64	dilutata, <i>Oporabia (Epirrita)</i> 12, 29, 30, 61, 68
culiciformis, <i>Trochilium (Ægeria)</i> 11, 12, 192	dipora, <i>Everes</i> 301-305
cuneata (<i>adippe ab.</i>), <i>Argynnис</i> .. 222	diporides (<i>argiades var.</i>), <i>Everes</i> 301, 302, 303, 304
cuprealis, <i>Aglossa</i> 299	dispar, <i>Chrysophanus</i> 183, 245, 284
cursoria, <i>Agrotis</i> 310	dispar, <i>Porthetria (Ocneria)</i> 93, 173, 221
curtisellus, <i>Prays</i> 210	dissoluta, <i>Nonagria</i> 164, 166, 167, 288-291, 309
Cyaniris 182	dissoluta (<i>neurica var.</i>), <i>Nonagria</i> 309
Cyaniris (<i>Polyommatus</i>) 183	distinctella, <i>Bryotropha</i> 64
Cyclopides 14, 16, 32, 33, 153	dives (<i>paphia var.</i>), <i>Dryas</i> 70
cyllarus, <i>Nomiades</i> 75, 76, 78, 173, 176, 179	dodoneata, <i>Eupithecia</i> 30
cynipiformis, <i>Ægeria</i> 11	dolabaria, <i>Eurymene</i> 30, 61
cynthia, <i>Melitaea</i> 55, 301	dominula, <i>Callimorpha</i> 86, 136, 243, 269, 271
cynthia, <i>Philosamia</i> 120	donzelii, <i>Polyommatus</i> 54, 55, 194, 301
cytisaria, <i>Pseudoterpnæa</i> <i>see</i> <i>pruin-</i> <i>ata</i> , <i>P.</i>	dorilis, <i>Loweia</i> 77, 78, 180, 222, 246, 278, 301
dahlii (<i>euphorbiæ var.</i>), <i>Hyles</i> 173, 204	dotata, <i>Cidaria</i> 62

PAGE.	PAGE.
doubledayaria (betularia <i>ab.</i>), Amphidasys 61, 84, 85, 217, 309	evonymellus, Hypenomeuta 210, 211
Drepana 205	exanthemaria, Cabera 61
dromus (tyndarus <i>var.</i>), Erebia .. 179	exæcata, Smerinthus 203
dryas, Enodia (Satyrus) 222	exiguata, Eupithecia 30
dubitata, Scotosia 62	expallidata, Eupithecia .. 61, 271
dumeriliellus, Nemotois 138	expressata (hellmanni <i>ab.</i>), Non-
duplaris, Cymatophora 64, 227, 228	agria 121
Dysstroma (Polyphasia) 143	extranea, Leucania <i>see</i> unipuncta,
edelsteni, Nonagria 164-168, 268, 286-293, 309	L.
edentula (bidentata <i>ab.</i>), Gonodontis 121	extrema (fulva), Nonagria 289
edusa, Colias 86, 97, 178, 180, 192, 193, 239, 279, 300	exulans, Anthrocera 74, 108, 193, 195, 270, 274
Edwardsia <i>see</i> Chattendenia	exulis, Crymodes 242, 243, 269, 285
egeria, Pararge 29, 71, 77, 78, 177, 180, 279	fagella, Diurnea 84, 85
elinguaria, Crocallis 20, 24, 29, 61	fagi, Stauropus 271
elisa, Argynnis 226	fangi (<i>in error</i> for langi) monogr.,
elpenor, Eumorpha (Phryxus) 204, 270, 296	Smerinthus 203, 311
elpenor (<i>in error</i> for gallii), Eumorpha 204, 311	farinalis, Pyralis 299
elutata, Hypsipetes 12, 13, 18, 62, 298	farinatella, Cedestis 64, 104
elymi (cardui <i>ab.</i>), Pyrameis .. 172	fascelina, Dasychira 272
elymi, Tapinostola 267	fauna, Marasmarcha 52, 53
emberizaæpennella, Lithocolletis 63, 105	fausta, Anthrocera 172
emarginata, Acidalia 61, 298	favicolor, Leucania 13, 168, 242
emutaria, Acidalia 13	feisthamelii (<i>podalirius</i> <i>var.</i>),
epilobii <i>hybr.</i> , Phryxus 204	Papilio 176, 177, 180
epiphron, Erebia 24, 150, 179, 180, 193, 207, 273, 274, 300	ferrugata, Coremia 17, 20, 62, 121, 310
epixanthe, Epidemis 94	ferruginascens (<i>comitata</i> <i>ab.</i>),
Erebia 97, 207	Pelurga 121
ericetaria, Selidosema 64	festiva, Noctua 17, 18, 227
Erichila (Herminia) 205	festucæ, Plusia 30, 121, 295
erigatus (angustalis), Botys 141, 142	fibulata (<i>fluctuata</i> <i>ab.</i>), Melanippe 62
erippus, Anosia 238	filigrammaria, Oporabia 12, 18, 20
eris (<i>niobe</i> <i>var.</i>), Argynnis 126, 150	filigrammaria (<i>autumnaria</i> <i>var.</i>),
eros, Polyommatus 194, 207, 221, 300, 301	Oporabia 29, 30
erosaria, Ennomos 64	filipendulaæ, Anthrocera 24, 73, 74, 86, 218, 248
erynnis (gorge <i>ab.</i>), Erebia 169	fimbrialis, Thalera 128
erythrocephala, Orrhodia 285	firmata, Thera 270
erythrogenella, Nepticula 45	fischeri, Tongeia (<i>Lycæna</i> , <i>Everes</i>) 81, 235
escheri, Polyommatus 54, 55, 177, 179, 236	fischeri, Fredericina <i>see</i> tessera-
eucharis, Delias 148	dactyla, F.
Euchloë 261	flammatra, Noctua 242, 285
eugenii <i>hybr.</i> , Phryxus 204	flammea, Meliana 297
eumedon, Aricia 54, 127, 173, 301	flava (thaumas), Adopæa 15, 16, 32, 33, 98, 107, 126, 137, 138, 147, 279, 280
euphenoides, Euchloë 177, 180	flava (achilleæ <i>ab.</i>), Anthrocera .. 74
euphorbiæ, Hyles 97, 173, 204, 284	flava (exulans <i>ab.</i>), Anthrocera .. 270
euphorbiata, Minoa 127	flava (griseola <i>ab.</i>), Lithosia 119
euphrosyne, Borethys 55, 75, 76, 78, 99, 107, 126, 138, 149, 150, 207, 226, 243	flava (vespertilio <i>ab.</i>), Thaumas 173
Eupithecia 102, 103	flavescens (fulvago <i>ab.</i>), Citria 148
curyale, Erebia 107, 150, 193, 194, 206, 300	flavicinctata, Larentia 107
curybia (hippotheræ <i>var.</i>), Chryso- phanus 54, 179	flavicornis, Asphalia 11, 20
Everidi 305	flavidior (<i>simplicior</i> <i>var.</i>), Antho-
evias, Erebia 76, 78, 177, 178, 179, 180, 300	charis 75, 76, 78, 169

	PAGE.		PAGE.
fraxinata, <i>Eupithecia</i>	102, 103,	grossana, <i>Carpocapsa</i>	.. .. 63
	104, 145	grossulariata, <i>Abraxas (Phalæna)</i>	
fringsi, <i>hybr.</i> = (hybridus), <i>Smerin-</i>		17, 24, 30, 61, 145, 173, 205,	
thus	.. .. 203	242, 243, 270, 272, 310	
fuciformis, <i>Hemaris</i>	.. .. 127	grutzneri (xanthomelas <i>ab.</i>),	
fugitivella, <i>Teleia</i>	.. .. 64	<i>Eugonia</i> 172	
fuliginosa, <i>Phragmatobia</i>	11, 30, 285	gschwandneri <i>hybr.</i> , <i>Phryxus</i>	.. .. 204
fulva (extrema), <i>Nonagria</i>	18, 289	haliphron, <i>Troides</i>	.. .. 72
fulvago (cerago), <i>Citria</i>	.. 148, 241	harmuthi <i>hybr.</i> , <i>Phryxus</i>	.. .. 204
fusca, <i>Pygmæa</i>	.. .. 274	haworthii, <i>Celæna</i>	.. .. 18, 272
fuscalis, <i>Botys</i>	.. .. 299	helice (<i>edusa var.</i>), <i>Colias</i> 178, 180, 192	
fuscantaria, <i>Ennomos</i>	.. .. 61	Heliothis = <i>Chloridia</i>	.. .. 119
fuscantaria (piniarius <i>ab.</i>), <i>Bupalus</i>	121	hellmanni, <i>Tapinostola</i>	.. .. 121, 297
fuscata (marginaria <i>var.</i>), <i>Hybernia</i>	84, 85	helveticaria, <i>Eupithecia</i>	.. .. 285
fuscedinella, <i>Coleophora</i>	105, 210, 211	hemerobiella, <i>Coleophora</i>	.. .. 105
fuscula, <i>Erastria</i>	.. .. 227	Heodes	.. .. 181, 182, 183
galathea, <i>Melanargia</i>	55, 78, 97,	heparana, <i>Tortrix</i>	.. .. 310
	125, 136, 138, 221, 242, 247, 270	hepatica, <i>Xylophasia</i>	.. .. 227
galiphorbiæ <i>hybr.</i> (=phileuphor- biæ), <i>Hyles</i>	.. .. 204	hera, <i>Callimorpha</i>	.. .. 86, 246
gallii, <i>Celerio (Phryxus)</i>	55, 204,	herbida, <i>Aplecta</i>	.. .. 227, 272
	272, 284	hermannæ, <i>Chrysopora (Aristo-</i>	
gallii (by error = elpenor), <i>Phryxus</i>	204, 311	<i>telia</i>)	.. .. 243, 251
gamma, <i>Plusia</i>	.. .. 30	Herminia (= <i>Erichila</i>)	.. .. 205
gmina, <i>Apamea</i>	.. .. 30	hermione, <i>Satyrus</i>	.. .. 187, 188
geminipuncta (paludicola), <i>Nonag-</i>		hessii (neurica <i>ab.</i>), <i>Nonagria</i>	167,
ria	.. .. 289, 290		290, 291
Geometra	.. .. 129, 205	Heterocera	.. .. 78
Geometra (= <i>Phalæna</i>)	.. .. 141, 205	hethlandica (<i>humuli var.</i>), <i>Hepi-</i>	
Geometrides	.. .. 60, 141, 142	<i>alus</i>	.. .. 270, 271
Geometriæ	.. .. 128	hexapterata, <i>Lobophora</i>	.. .. 13, 30
geryon, <i>Adscita</i>	98, 149, 150, 195, 228	hibernica (<i>aurinia var.</i>), <i>Melitæa</i>	68
giesekingi <i>mongr.</i> , <i>Phryxus</i>	.. .. 204	hiera, <i>Pararge</i>	.. .. 76, 78, 107, 178
gillyi <i>hybr.</i> , <i>Phryxus</i>	.. .. 204	hilaris (<i>promissa var.</i>), <i>Catocala</i>	45
gilvago, <i>Mellinia</i>	.. .. 241	Hipparchus = <i>Leptornis</i>	.. .. 205
glabraria, <i>Cleora</i>	.. .. 64, 310	hippocrepidis, <i>Anthrocera</i>	.. .. 23,
glacialis, <i>Erebia</i>	.. .. 192, 206, 207		74, 78, 218, 247, 248, 309
glandifera, <i>Bryophila</i> <i>see</i> <i>muralis</i> ,		hippocrepidis (transalpina), <i>An-</i>	
B.		<i>throcera</i>	.. .. 74
glareosa, <i>Noctua</i>	.. .. 29, 272	hippophaës, <i>Turneria</i>	.. .. 173
glaucæ, <i>Hadena</i>	.. .. 13, 17, 272	hippothoë, <i>Chrysophanus</i>	.. .. 54, 98,
glaucata, <i>Cilix</i>	.. .. 205		107, 138, 179, 181, 206, 273, 301
glaucinaria, <i>Gnophos</i>	.. .. 128	hirtaria, <i>Biston</i>	.. .. 120, 121
glaucus, <i>Jasoniades (Papilio)</i>	.. .. 255	hispida, <i>Nyssia</i>	.. .. 11
globulariæ, <i>Rhagades</i>	.. .. 228	hispulla (<i>jurtina var.</i>), <i>Epinephele</i>	.. .. 177, 180
gnaphalii, <i>Cucullia</i>	.. .. 13	huenei (<i>jurtina ab.</i>), <i>Epinephele</i>	121
goante, <i>Erebia</i>	97, 98, 107, 136,	humiliata, <i>Acidalia</i>	.. .. 271, 272
	149, 150, 193, 194, 206, 221, 300	humuli, <i>Heptalus</i>	120, 202, 270, 271
gœdartella, <i>Argyresthia</i>	.. .. 104	huntera (<i>virginiensis</i>), <i>Pyrameis</i>	122
gonodactyla, <i>Platyptilia</i>	.. .. 18, 206, 238	hutchinsoni (c-album <i>var.</i>), <i>Poly-</i>	
gordius (aleiphron <i>var.</i>), <i>Lowenia</i>		<i>gonia</i>	.. .. 23, 3
(<i>Chrysophanus</i>)	.. .. 54, 127,	hyale, <i>Colias</i>	.. .. 75, 76, 77, 78,
	136, 137, 177, 300		97, 121, 222, 246, 279
gorge, <i>Erebia</i>	.. .. 55, 108, 169, 207,	hybridus <i>hybr.</i> , <i>Smerinthus</i>	.. .. 203,
	273, 274, 300		242, 268, 309
gorgone, <i>Erebia</i>	.. .. 151	Hydroæcia	.. .. 184
graminis, <i>Charæas</i>	.. .. 18, 195	Hydrocampus	.. .. 141, 142
granitella, <i>Acrolepia</i>	.. .. 45	hylas, <i>Polyommatus</i>	.. .. 55, 77, 78,
graphodactyla, <i>Adkinia</i>	.. .. 174, 176,		98, 107, 126, 177, 247, 301
	214, 271	hyperanthus, <i>Enodia (Aphantopus)</i>	.. .. 119, 222, 243, 246, 247, 248,
grisealis, <i>Zanclognatha</i>	.. .. 227		270, 279, 280, 284
griseocapitella, <i>Swammerdammia</i>	.. .. 192	hyperborea, <i>Pachnobia</i>	.. .. 270
griseola, <i>Lithosia</i>	.. .. 119, 296	Hyponomeuta	.. .. 185

PAGE.	PAGE.
ianira, Epinephele <i>see</i> jurtina, E.	
ibipennella, Coleophora	105
icarinus (icarus <i>ab.</i>), Polyommatus	
	221, 274
icarus, Polyommatus 19, 75, 76,	
77, 78, 90, 116, 126, 137,	
144, 148, 174, 176, 193, 194,	
207, 221, 222, 234, 246, 247,	
	274, 278, 279
ilicifolia, Gastropacha	96, 285
ilicis, Thecla 177, 178, 180, 300	
Ilithyia	141, 142
illuminata (jurtina <i>ab.</i>), Epinephele	121
illunaria, Selenia	12
illustraria, Ennomos	243
imbutata, Carsia	193, 195, 208
imitaria, Acidalia	228
immanata, Cidaria (<i>Dysstroma</i>) 29,	143
immorata, Acidalia	228
immutata, Acidalia 119, 240, 248,	298
impluviata, Hypsipetes .. 12, 18, 127	
impunctata (satyrium <i>ab.</i>), Cœn-	
onymptha	207
impura, Leucania	119, 297
incanata (fluctuata <i>ab.</i>), Melanippe	62
incanaria, Acidalia <i>see</i> virgularia, A.	
Incisalia	21
innotata, Eupithecia 102, 103, 144	
ino, Brenthis 54, 194, 205, 227, 280	
insignata (viridata <i>var.</i>), Nemoria	
	129, 132
interjecta, Triphæna	297
intermedia (rurea <i>var.</i>), Xylophasia	42
interpunctella, Plodia	310
interrogationis, Plusia	12
interrupta (purpuralis <i>var.</i>), An-	
throcera	73
inversa <i>hybr.</i> , Smerinthus ..	203
io, Vanessa 29, 41, 63, 75, 78, 136,	
	172, 221
iolas, Nomiades	300
iota, Plusia	30
iphis, Cœnonympha	300
iris, Apatura	127, 160, 280
irregularis, Dianthæcia	296, 298
irrorella, Setina 149, 195, 208, 271,	274
isogrammata, Eupithecia	119, 128
jacobææ, Euchelia	172
jachontovi (daphidice <i>var.</i>), Pieris	121
janira, Epinephele <i>see</i> jurtina, E.	
jasioneata, Eupithecia	285
jasius, Charaxes	189
jucunda (fausta <i>ab.</i>), Anthrocera ..	172
juncicolella, Coleophora	105
juniperata, Thera	62
jurassica (carniolica <i>var.</i>), Anthro-	
cera	172
jurtina (janira, ianira), Epinephele	
19, 24, 84, 121, 127, 148, 177,	
180, 193, 221, 240, 246, 247,	
248, 254, 271, 279, 280, 284,	
	299, 310
knautiata (minutata <i>var.</i>), Eupith-	
ecia	30
laburnella, Cemistoma 210, 216, 271	
lachesis, Melanargia 177, 178, 180	
læta (sponsa <i>var.</i>), Catocala	45
lævigatella, Argyresthia	210
laidion (tiphon <i>var.</i>), Cœnonympha	
	245, 279
lambdella, Ecophora	64
Lampides	140, 182, 183
Lampididi	183
lanceolana, Bactra	193
lanceolata (hyperanthus <i>ab.</i>),	
Enodia (Aphantopus)	284
lanestris, Eriogaster	70
Langia (=Raywardia)	143
langi (<i>by error fangi</i>) mongr., Phryxus	
	203, 311
lappona, Erebia 108, 178, 180, 207,	273
lapponaria, Nyssia	11
lapponica (argyrognomon <i>var.</i>),	
Plebeius (Lycæna)	218
laricella, Coleophora	210
lathouia, Issoria 54, 77, 78, 97,	
	107, 136, 149, 150, 193, 194, 207
lavandulae, Anthrocera	218
lavateræ, Erynnis	55, 179
leda, Melanitis	22
Leechia (=Strymonidia)	143
lefebvrei, Erebia	50, 179, 192
leonieæ <i>hybr.</i> , Smerinthus	203
leporina, Acronycta	272
Leptidia	190
Leptornis	205
leucostigma, Helotropha	297
leucotænia (<i>æthiops ab.</i>), Erebia ..	206
levana, Araschnia	21, 22
leuwenhoeckella, Pancalia	192
libatrix, Scoliopteryx	227, 297
lichenaria, Cleora	29
lichenea, Epunda	11, 13, 285
lienigialis, Pyralis	71
ligea, Erebia 49, 107, 221, 273, 280	
ligniperda, Cossus	210, 211, 266
ligurica (arion <i>ab.</i>), Lycæna	172
ligustri, Bisulcia	227
limitata, Eubolia	30
limosipennella, Coleophora	105
linea, Adopæa <i>see</i> flava, A	
linearia, Zonosoma	244
lineata, Scoria	78
lineola, Adopæa	98, 126, 296
lineolata, Eubolia	64
lineolata (virgaureæ <i>ab.</i>), Heodes	
(<i>Chrysophanus</i>)	195
lippei (=burckharti) <i>hybr.</i> , Phryxus	
	204, 311
lithargyria, Leucania	297
Lithocletis	163
lithodactyla, Oidæmatophorus	299
littoralis, Leucania	13
liturata, Macaria	242, 272
livornica, Phryxus	284
loniceræ, Anthrocera 49, 64, 86,	
	97, 107, 126
lotella, Anerastia	64
louristana (cerisyi <i>ab.</i>), Thais	70

PAGE.	PAGE.
lucens, <i>Hydrocia</i> .. 146, 184, 272	melanopa, <i>Anarta</i> .. 270, 271
luciani (<i>by error luciens</i>) <i>hybr.</i> , <i>Phryxus</i> 204, 311	melas, <i>Erebia</i> 192
luciens (<i>by error for luciani</i>) <i>hybr.</i> , <i>Phryxus</i> 204, 311	meleager, <i>Agriades</i> 300
lucilla, <i>Neptis</i> 192	melinaria, <i>Nemoria</i> 129
lucina, <i>Nemeobius</i> 75, 76, 77, 78, 178, 254, 310	melissa, <i>Plebeius (Rusticus)</i> 90
luctiferellus, <i>Crambus</i> 274	Melitaea 195
lunedactyla (<i>phædactyla</i>), <i>Maras-</i> <i>marcha</i> .. 50, 51, 52, 53, 247	melliculus (<i>apollo ab.</i>), <i>Parnassius</i> 174
lunaris, <i>Ophideres</i> 212, 270	mendica, <i>Spilosoma</i> 86
lunigera, <i>Agrotis</i> 271	mensuraria, <i>Eubolia</i> 248
lupulinus, <i>Heptalus</i> 120	menthastri, <i>Spilosoma</i> 30
lurideola, <i>Lithosia</i> .. 119, 195, 296	menyanthidis, <i>Acronycta</i> 13
lutarella, <i>Lithosia</i> 64, 195	meridionalis, <i>Ornithoptera</i> 172
lutearia, <i>Cleogene</i> 152, 159	mesomella, <i>Lithosia</i> 272
luteata, <i>Asthena</i> 119	messaniella, <i>Lithocletis</i> 210
luteolata, <i>Rumia</i> 121	meticulosa, <i>Phlogophora</i> 227
lutipennella, <i>Coleophora</i> 105	metis (= <i>inversa</i>) <i>hybr.</i> , <i>Smerinthus</i> 203
lutosa, <i>Calamia</i> 296	miata, <i>Cidaria</i> 30
lutulenta, <i>Epunda</i> 285	micacea, <i>Hydrecia</i> 18
Lycænidæ .. 181, 182, 191, 304	microdactyla, <i>Adaina</i> 18, 145
Lycæninæ 182, 183	miegii (<i>virgaureæ var.</i>), <i>Heodes</i> (<i>Chrysophanus</i>) 98
lycaon, <i>Epinephele</i> 55, 97, 127, 136	miniata, <i>Calligenia</i> 148
lychnitis, <i>Cucullia</i> 121	minima(us), <i>Cupido</i> 75, 76, 78, 90, 116, 177, 194, 207, 236, 302
Lycus 182	minor (trifolii var.), <i>Anthrocera</i> .. 247
machaon, <i>Papilio</i> 75, 78, 97, 107, 125, 172, 193, 240, 254, 255, 266, 279, 296	minos, <i>Anthrocera</i> <i>see</i> <i>purpuralis</i> , A.
macularia, <i>Venilia</i> 121	minutata, <i>Eupithecia</i> 30
maculiferella, <i>Lita</i> 64	mirabilis (<i>populi, ab.</i>), <i>Amorpha</i> 173
mæra, <i>Pararge</i> 49, 54, 77, 78, 97, 106, 126, 177, 178, 180, 300	mnemosyne, <i>Parnassius</i> 177, 178
major (<i>Ionicera var.</i>), <i>Anthrocera</i> 49	menestra, <i>Erebia</i> 54, 107, 150
malve, <i>Hesperia</i> 75, 77, 78, 173, 177	monacha, <i>Lymantria</i> 95, 221
mannii (<i>rapæ var.</i>), <i>Pieris</i> 253	moneta, <i>Plusia</i> 214, 243
manto, <i>Erebia</i> 206	monodactyla, <i>Emmelina</i> 193, 299
Marasmarcha 51, 52, 53	montanata, <i>Melanippe (Larentia)</i> 30, 62, 78, 107, 121, 208
margaritata, <i>Metrocampa (Tribacis)</i> 61, 205	mori, <i>Bombyx</i> 70
margaritellus, <i>Crambus</i> 193, 278, 280	morphæus, <i>Heteropterus</i> 180
marginata, <i>Lomaspilis</i> 12, 61, 298	morrisii (<i>bondii</i>), <i>Tapinostola</i> 24, 270
marginaria (<i>progemmaria</i>), <i>Hyper-</i> <i>nia</i> 20, 61, 84, 85	mouffetella, <i>Eupithecia</i> 104
marisola (<i>festucæ ab.</i>), <i>Plusia</i> .. 121	mucronellus, <i>Schœnobius</i> 298
maritima, <i>Senta</i> 94	multistrigaria, <i>Larentia</i> 11, 17
marmorea, <i>Rhodophæa</i> 310	mundana, <i>Nudaria</i> 20, 296
mathewi (<i>viridata ab.</i>), <i>Nemoria</i> 132, 133	mundata (<i>obscurata ab.</i>), <i>Gnophos</i> 243
matronalis (<i>plantaginis ab.</i>), <i>Nemeophila</i> 274	muralis (<i>glandifera</i>), <i>Bryophila</i> 24
matura, <i>Erebia</i> 54	muricata, <i>Hyria</i> 64, 298
mauretanica (<i>euphorbiæ var.</i>), <i>Hyles</i> 173	murina (<i>vespertilio var.</i>), <i>Thaumas</i> 173
medesicaste (<i>ruminæ var.</i>), <i>Thaïs</i> 177, 180	muringata, <i>Minoa</i> 186
medusa, <i>Erebia</i> 76, 78, 192	muringipennella, <i>Coleophora</i> 105
megæra, <i>Pararge</i> 76, 78	mutata, <i>Acidalia</i> 107
melampus, <i>Melampias (Erebia)</i> 55, 98, 107, 150, 194, 206, 273	Mycalesis 22
melana (<i>dilutata ab.</i>), <i>Oporabia</i> 61	myricæ, <i>Acronycta</i> 13
Melanitis 22	myrmidone, <i>Colias</i> 192
melanocephala (<i>leporina ab.</i>), <i>Acronycta</i> 272	myrtillæ, <i>Anarta</i> 20
	nanata, <i>Eupithecia</i> 20, 29
	napææ (<i>pales var.</i>), <i>Brenthis</i> 206
	napi, <i>Pieris</i> 23, 75, 78, 188, 218, 243, 269, 279, 280
	narcissus, <i>Mycalesis</i> 22
	neapolisata (<i>fluctuata ab.</i>), <i>Mela-</i> <i>nippe</i> 62
	nebulosa, <i>Aplecta</i> 272, 307
	neglecta, <i>Noctua</i> 24
	nemoralis, <i>Agrotera</i> 270
	nemorella, <i>Cerostoma</i> 104

	PAGE.		PAGE.
Nemoria	133	topus (Enodia) ..	243
neopalæarctica <i>hybr.</i> , Smerinthus	203	obsoleta (<i>orbitulus ab.</i>), Polyommatus ..	274
Nepticula	44, 45, 72, 252	occitanica (phœbe <i>var.</i>), Melitaea	
neurica, Nonagria	164-168, 268, 286-293, 309	54, 55, 105, 169-171	
neustria, Malacosoma	70, 295	occultana, Pædisca	210
nexa, Nonagria	288	ocellana, Hedyia	64, 210, 211
nicea, Hyles	173	ocellaris, Mellinia	23, 240
nicholli, Protagrotis	94	ocellata, Melanthia	62
nicholli (glacialis <i>var.</i>), Erebia ..	192	ocellata, Smerinthus	203, 210, 309
nictitans, Hydrecia	146, 184, 310	ocellata (jurtina <i>ab.</i>), Epinephele ..	247
nigra (aleon <i>var.</i>), Lycæna	301	ocellata-populi <i>hybr.</i> , Smerinthus	
nigra (arcas <i>var.</i>), Lycæna	278	242, 309	
nigra (consonaria <i>ab.</i>), Tephrosia	148	ochracea (<i>ethiops ab.</i>), Erebia ..	206
nigricans, Agrotis	13, 272, 297	ochracea (<i>pronoë ab.</i>), Erebia ..	206
nigrofulvata (liturata <i>var.</i>), Macaria		ochrata, Acidalia	13, 64, 270
	242, 272	ochrea (rurea <i>ab.</i>), Xylophasia	42
nigrolineata (prunaria <i>ab.</i>), Ange-		ochroleuca, Eremobia	270
rona	96	ochsenheimeri, Anthrocera	126, 138
nigrorubida (rurea <i>ab.</i>), Xylophasia	42	ocnerostomella, Douglassia	64
nigrosericeata (rectangulata <i>ab.</i>),		octomaculata, Ennychia	98
Eupithecia	61	œdipus, Cœnonympha	180, 181, 192
nigrosparsata (grossulariata <i>ab.</i>),		œme, Erebia	78, 179
Abrazas	242	olivacea (chi <i>var.</i>), Polia	272, 285
niobe, Argynnus	97, 107, 125, 126,	olivacea (quercûs <i>ab.</i>), Lasiocampa ..	43
127, 137, 138, 139, 149, 150,		olivaceo-fasciata (quercûs <i>ab.</i>),	
194, 205, 273		Lasiocampa	43
nisseni (=theryi) (lavandulæ <i>var.</i>),		olivaceo-marginata (viridata <i>ab.</i>),	
Anthrocera	218	Nemoria	132, 133
nitidella, Argyresthia	104	olivata, Larentia	13
nivatus (apollo <i>var.</i>), Parnassius ..	173	omicronaria, Zonosoma	186
nivearia, Cleogene	152, 159	ononaria, Aplasta	123, 128
niveidactyla (baliodactyla), Merri-		onosmella, Coleophora	23
fieldia (Wheeleria)	247	operosa (hybridus <i>var.</i>), Smerinthus	203
niveus, Acentropus	64	ophthalmicana, Pædisca	210, 211
Noctua	158	Oporabia	12
Notodonta	158	optilete, Plebeius	55, 193, 233, 301
nubeculosa, Asteroscopus	285, 310	or, Cymatophora	13, 227
nupta, Catocala	86, 93	orbitulus, Polyommatus	55, 179,
nymphagoga, Catocala	93	180, 207, 273, 274, 301,	
nymphæata (potamogata), Hydro-		orichalcea, Plusia	279
campa (Botys)	141, 142, 247	orientalis (aurinia <i>var.</i>), Melitaea	78
oberthueri <i>hybr.</i> (=hybridus),		orientalis (nicæa <i>var.</i>), Hyles ..	173
Smerinthus	203	orion, Scolitantides	144, 176,
oberthüri (orbitulus <i>var.</i>), Poly-		177, 180, 272	
ommatus	180	ornata, Acidalia	99
oberthüri (pyrenaica <i>var.</i>), Lycæna		Ornithoptera	172, 202
179, 180		ornithopus, Xylina	30
obfuscata, Dasydia (Gnophos) ..	49,	orophila, Plusia	94
98, 107, 149, 193, 195, 201, 207		ossea (nitidella <i>var.</i>), Argyresthia	104
oblongata (centaureata), Eupithecia		osseana, Aphelia	193
20, 61		osteodactyla, Hellinsia	145
obscura (arion <i>var.</i>), Lycæna ..	55, 107, 301	ostrina, Micra	285
obscura (daphne <i>ab.</i>), Brenthis	172	Ourapteryx (=Uraptera)	205
obscura (trifolii <i>ab.</i>), Anthrocera	23, 268	oxyacanthæ, Miselia	20
obscurata, Gnophos	243	padellus, Hyponomeuta	185
obsoleta, Leucania	285, 295, 297	palæmon, Cyclopides	14, 15, 30,
obsoleta (castrensis <i>ab.</i>), Malaco-		31, 32, 33, 54, 65, 76, 77,	
soma	271	78, 146	
obsoleta (corydon <i>ab.</i>), Agriades		palæno, Colias	149, 207, 300
270, 271		pales, Brenthis	107, 108, 150,
obsoleta (epiphron <i>ab.</i>), Erebia ..	274	193, 206, 270, 273, 274	
obsoleta (eros <i>ab.</i>), Polyommatus ..	194	pallescens (pronoë <i>ab.</i>), Erebia ..	206
obsoleta (hyperanthus <i>ab.</i>), Aphan-		pallens, Leucania	119, 168, 272, 297

	PAGE.
pallida, <i>Scoparia</i> ..	299
pallida (euryale <i>ab.</i>), <i>Erebia</i> ..	206
pallida (nebulosa <i>ab.</i>), <i>Aplecta</i> ..	272
pallida (pales <i>ab.</i>), <i>Brenthis</i> ..	206
pallidactyla, <i>Gillmeria</i> ..	271
paludicola, <i>Buckleria</i> ..	69
paludicola, <i>Nonagria</i> <i>see gemini-puncta</i> , N.	
paludis, <i>Hydrecia</i> ..	146, 184, 272
paludum, <i>Buckleria</i> ..	53, 69
palumbaria, <i>Eubolia</i> ..	62
palumbella, <i>Pempelia</i> ..	64
palustris, <i>Anthrocera</i> ..	218, 248
palustris, <i>Hydrilla</i> ..	285, 299
pampphilus, <i>Cœnonympha</i> 19, 78, 86, 121, 193, 194, 222, 240, 243, 246, 247, 279, 280	
pantaria (<i>sylvata var.</i>), <i>Abraxas</i> ..	23
paphia, <i>Dryas</i> ..	55, 70, 126, 127, 136, 139, 192, 221, 222, 226, 243, 246, 254, 268, 280, 307
Papilio ..	22
papilionaria, <i>Geometra (Leptornus)</i> ..	61, 131, 134, 205, 298
paradisea, <i>Ornithoptera</i> ..	172
Parnassius ..	126
parrhasius, <i>Binghamia</i> ..	301-305
parthenie, <i>Melitaea</i> ..	75, 76, 77, 78, 177, 179
parvidactyla, <i>Oxyptilus</i> ..	186
pasiphæ, <i>Epinephele</i> ..	172, 178, 180
pastinum, <i>Toxocampa</i> ..	119, 296, 297
pavonia, <i>Saturnia</i> ..	67, 70, 192
pedaria (pilosaria), <i>Phigalia</i> ..	11, 20, 61
peletieraria, <i>Cleogene</i> ..	151-159
peltigera, <i>Heliothis</i> ..	285
pennaria, <i>Himera</i> ..	29, 61
pentadactyla, <i>Alucita</i> ..	18, 299
perfumaria (<i>rhomboïdaria ab.</i>), <i>Boarmia</i> ..	18
perlellus, <i>Crambus</i> ..	278
permutana, <i>Peronea</i> ..	272, 310
pernoldi <i>hybr.</i> , <i>Phryxus</i> ..	204
pernoldiana <i>hybr.</i> , <i>Phryxus</i> ..	204
perochraria, <i>Acidalia</i> ..	222
petasitis, <i>Hydrecia</i> ..	272
petraria, <i>Panagra</i> ..	29, 61
pfeifferella, <i>Antispila</i> ..	63
phæodactyla, <i>Marasmarcha</i> <i>see lunadactyla</i> , <i>Marasmarcha</i>	
Phalæna (<i>Geometra</i>) ..	141, 205
phalanta, <i>Atella</i> ..	22
Phaophyga (<i>Bupalus</i>) ..	205
phegea, <i>Syntomis</i> ..	218
pheretes, <i>Polyommatus</i> ..	54, 207, 301
phicomone, <i>Colias</i> ..	55, 107, 108, 151, 193, 194, 207, 273, 300
philenor, <i>Laërtias</i> (<i>Papilio</i>) ..	255
phileuphorbia <i>hybr.</i> , <i>Phryxus</i> ..	204
philoxenus (<i>tiphon var.</i>), <i>Cœnonympha</i> ..	279
phlæas, <i>Rumicia (Chrysophanus)</i> ..	
19, 21, 127, 137, 149, 181, 183, 242, 266, 271	
phœbe, <i>Melitaea</i> ..	54, 55, 96, 98, 105, 144, 169-171, 177, 193, 301
phœnicaea (<i>achilleæ var.</i>), <i>Anthrocera</i> ..	74
phragmitellus, <i>Chilo</i> ..	298
phragmitidis, <i>Calamia (Nonagria)</i> ..	94, 289, 297
phrygialis, <i>Titanio (Scopula)</i> ..	108, 208
picata, <i>Cidaria</i> ..	228
pictaria, <i>Aleucis</i> ..	12
Pieris ..	253
pilosaria, <i>Phigalia</i> <i>see pedaria</i> , <i>P. pilosaria</i> , <i>Oxyptilus</i> ..	247
pimpinellata, <i>Eupithecia</i> ..	13
pinastri, <i>Hyloicus</i> ..	284
pinetaria, <i>Fidonia</i> ..	12
pinguinalis, <i>Aglossa</i> ..	299
pinguis, <i>Euzophera</i> ..	64
piniaria(<i>us</i>), <i>Bupalus (Ematurga, Phaophyga)</i> ..	12, 121, 205, 210
pinicolana, <i>Retinia</i> ..	64
piniperda, <i>Panolis</i> ..	192, 210, 211
pitho (<i>pronoë var.</i>), <i>Erebia</i> ..	206
plagicoella, <i>Nepticula</i> ..	45, 72
plantaginis, <i>Nemeophila</i> ..	86, 274
Plebeius ..	183
plumbaria, <i>Eubolia</i> ..	24
Plusia ..	172
pneumonanthes (<i>graphodactyla var.</i>), <i>Adkinia</i> ..	174, 176, 214
podalirius, <i>Iphiclidæ (Papilio)</i> ..	
75, 77, 78, 176, 177, 180, 254	
polaris (<i>urticæ ab.</i>), <i>Aglais</i> ..	24
polios, <i>Incisalia</i> ..	21
polychloros, <i>Eugonia</i> ..	76, 78, 172, 242
polygramma, <i>Phibalapteryx</i> ..	285
polyodon, <i>Xylophasia</i> ..	18, 24
Polyommatus ..	183
Polyphasia (= <i>Dysstroma</i>) ..	143
polysperchinus (<i>parrhasius ab.</i>), <i>Binghamia (Everes, Plebeius)</i> ..	
302, 304, 305	
polypserchon (<i>argiades ab.</i>), <i>Everes</i> ..	
78, 79, 80, 232, 233, 234, 235-236, 265, 266	
popularis, <i>Neuronia</i> ..	64
populata, <i>Cidaria</i> ..	18, 193, 206
populeti, <i>Taniocampa</i> ..	30
populi, <i>Amorpha (Smerinthus)</i> ..	
62, 173, 203, 210, 309	
populi, <i>Najas</i> ..	192
populi, <i>Pœcilocampa</i> ..	20
porcellus, <i>Phryxus</i> ..	204
porima (<i>levana ab.</i>), <i>Araschnia</i> ..	21, 22
porrinaria, <i>Nemoria</i> ..	130
porrinata, <i>Nemoria</i> ..	129
posteroigrisea (<i>tiphon ab.</i>), <i>Cœnonympha</i> ..	279
potamogata, <i>Botys</i> <i>see nymphæata</i> , <i>Hydrocampæ</i> ..	
potatoria, <i>Cosmotrichæ</i> ..	23, 29, 86, 119, 295
præangusta, <i>Batrachedra</i> ..	104
præterita (<i>rapæ ab.</i>), <i>Pieris</i> ..	121
privata (<i>euphorbiæ ab.</i>), <i>Hyles</i> ..	173

	PAGE.		PAGE.
proboscidalis, Hypena ..	227	quercūs, Lasiocampa ..	20, 29, 43,
procida (galathea var.), Melanargia ..	242, 270	126, 133, 136, 172, 222, 272	
profundana, Pædisca ..	64	radiomarginaria (punctaria ab.),	
progemmaria, Hybrenia <i>see margin-</i>		Ephyra ..	96
aria, H.		ragonoti (carniolica ab.), Anthro-	
promethea, Callosamia ..	120	cera ..	172
promissa, Catocala ..	45, 93	rapæ, Pieris ..	19, 75, 78, 119, 121,
pronoë, Erebia ..	206	193, 207, 246, 253, 279, 301, 309	
pronubana, Tortrix ..	72, 94, 148,	ratzburghiana, Pædisca ..	64
	188, 213, 270	ravida, Agrotis ..	296
propugnata, Coremia ..	62	Raywardia (Langia) ..	143
prorsa (levana var.), Araschnia ..	21, 22	rectangulata, Eupithecia ..	61, 298
prosapiaria, Ellopia ..	61, 64	reducta (camilla ab.), Limenitis ..	172
provincialis (aurinaria var.), Melitæa ..	310	regiana, Stigmonota ..	210
pruniana, Penthina ..	210	repandata, Boarmia ..	12, 29, 61,
pruinata (cytisaria), Pseudoterpna ..	61, 121, 128, 270	119, 121, 122, 271, 272	
prunaria, Angerona ..	96, 228	resinana, Retinia ..	192, 210
prunetorum, Nepticula ..	72	reticulata, Neurica ..	297
pruni, Strymon ..	54, 162, 182, 183, 245	retinella, Argyresthia ..	104
pseudaglios, Celastrina ..	89	rhamnata, Scotosia ..	298
pseudonomion (apollo ab.), Par-		rhamni, Gonopteryx ..	75, 78, 98,
nassius ..	174	206, 254, 279, 299	
pseudospretella, Borkhausenia ..	92	rhomboidaria, Boarmia ..	18, 61
psi, Triæna ..	119, 216, 243	rhynchospora, Elachista ..	64
psittacata, Cidaria ..	64	ribeana, Tortrix ..	210
psodea (medusa var.), Erebia ..	192	rivata, Melanippe ..	62
pudorina, Leucania ..	297	robertsi (euphorbiæ var.), Hyles ..	173
pulchellata, Eupithecia ..	64, 272	roboraria, Boarmia ..	24
pulchrina, Plusia ..	30	roboris, Læosopis ..	177, 178, 180
pulveraria, Numeria ..	272	robsoni (nebulosa var.), Aplecta ..	272, 307
pumilata, Eupithecia ..	12, 29	rorellus, Hyponomeuta ..	267
punctaria, Ephyra ..	96	rosana, Tortrix ..	64
punctidactyla (=acanthodactyla),		roxelana, Pararge ..	192
Amblyptilia ..	222	rubi, Callophrys ..	21, 29, 75, 78,
punctularia, Tephrosia ..	61	162, 182, 183, 218	
purpuralis (minos), Anthrocera ..		rubi, Macrothylacia ..	11, 30, 120,
24, 73, 74, 86, 93, 97, 107,		121, 192	
126, 137, 138, 149, 150, 309		rubi, Noctua ..	243, 270
purpuralis (purpuraria), Botys ..	141, 142	rubi, Papilio ..	81
purpuraria (purpuralis), Botys ..	141, 142	rubianus (victorie var.), Troides ..	
pusaria, Cabera ..	61, 186	(Ornithoptera) ..	72
pustulata (bajularia), Phorodesma ..	61	rubiginata, Melanthia ..	62
puta, Agrotis ..	185	rubiginea, Dasycampa ..	285
putris (rurea ab.), Xylophasia ..	42	rubivora, Nepticula ..	45
pygmæata, Eupithecia ..	13, 30	rubricosa, Tæniocampa (Pach-	
pygmæoides (fausta var.), Anthro-		nobia) ..	17, 29
cera ..	172	rufa, Cœnobia ..	119, 294, 297
pygmæola (lutarella), Lithosia ..	13, 195	rufa (apollo ab.), Parnassius ..	174
pyraliata, Cidaria ..	298	ruficinctata (trifolii ab.), Anthrocera ..	248
pyrenaica, Polyommatus (Lycæna) ..	179	rufocinerea, Larentia ..	13
pyrenaica (atrata var.), Odezia ..		rufocinerea, Elachista ..	105
222-225, 264, 271		rufotincta (viridata ab.), Nemoria ..	132, 133
pyrenaica (epiphron var.), Erebia ..		Rumicia ..	181, 182, 183
179, 180		rumina, Thaïs ..	177, 180
pythonissa (camilla ab.), Limenitis ..	172	rupicapraria, Hybrenia ..	20, 29
quadra, Lithosia ..	221	Ruralidæ ..	181, 183
quadrifaria, Psodos ..	273	Ruralidi ..	182, 183
quercifolia, Eutricha ..	64, 86, 295	Ruralinæ ..	183
quercinaria, Ennomos ..	30	Ruralis ..	182, 183
quercūs, Bithys ..	93, 162, 180, 182,	ruralis (verticalis), Botys ..	141
	183, 222	rurea, Xylophasia ..	17, 41, 42
		russata, Cidaria (Polyphasia) ..	143

	PAGE.		PAGE.
russula, Euthemonia ..	206	siceliota, Stangeia ..	53
sacaria, Sterrhia ..	271	sichi (emphorbiæ ab.), Hyles ..	173
sagittata, Cidaria ..	298	sicula (quercus var.), Lasiocampa	172
salaciella, Opostega ..	105	siderata, Cidaria ..	30
salicata, Larentia ..	29	similis (auriflua), Porthesia	119, 272, 296
salicella, Dasytoma ..	63	simplicia, Anthocharis	55, 75, 76,
salicis, Leucoma 49, 50, 135, 145,			78, 169
	186, 187, 296	simulata, Thera ..	208
sambucaria, Urapteryx 61, 200,		sinapis, Leptidia	64, 75, 77, 78, 97,
	201, 205		98, 126, 136, 193, 228, 246,
sanio, Diacrisia ..	78		279, 280
sao, Powellia 55, 75, 76, 77, 78, 177		sinepuncta (orbitulus ab.), Poly-	
satellitaria, Scopelosoma ..	20	ommatu	274
saturatior (elymi var.), Tapinostola	267	sinuata, Anticlea ..	13, 24
saturnana, Dicrorampha ..	64	sociata, Melanippe ..	217
satyrata, Eupithecia ..	12	sociella (=colonum), Aphomia	
Satyrinae ..	254	(Botys) ..	137, 141, 228, 299
satyron, Cœnonympha 193, 194,		solitariella, Coleophora ..	105
	207, 273	sorbi, Lithocletis ..	105
saucia, Peridroma ..	96	sordidata (elutata), Hypsipetes	
scabiosata, Eupithecia ..	298	12, 13, 18, 23, 29, 62, 298	
scabiosellus, Nemotois ..	247	sparganiella, Orthotelia ..	64
scabriuscula, Dipterygia ..	23	sparganina, Nonagria ..	270, 271, 289
schalleriana, Acalla ..	45	sparsata, Collix ..	298
scitella, Cemiostoma ..	64	sphægiformis, Egeria ..	12
scoliaeformis, Aegeria ..	12, 285	spini, Thecla ..	300
Scoparia ..	49	spinosa, Nepticula ..	45, 72
scotica (=laidion) (=tiphon var.),		spinula, Cilix ..	20, 296
Cœnonympha ..	245	spoliata (aversata ab.), Acidalia	61, 119
scrophulariae, Cucullia ..	121	sponsa, Catocala ..	45
scutosa, Heliothis ..	242, 285	stagnata, Hydrocampus ..	64
scutulata, Acidalia ..	119, 298	Stangeia ..	53
sebrus, Cupido ..	76, 78, 236, 302	statices, Adscita ..	248
segetum, Agrotis ..	271	staudingeri (populi ab.), Amorpha	173
seggregata (fausta ab.), Anthrocera	172	stellatarum, Sesia ..	125, 247
selasellus, Crambus ..	278, 280, 298	stephensi, Anthrocera ..	218, 248
selene, Brenthis ..	138, 172, 226, 228	sthennyo (lappona var.), Erebia	
semele, Satyrus ..	86		178, 180
semialbescens (hyperanthus ab.),		straminata, Acidalia ..	64
Enodia (Aphantopus) ..	247	straminea, Leucania ..	94, 295, 297
semialbovirgata (w-album ab.),		stramineola (griseola var.), Lithosia	296
Chattendenia ..	161	strandii (ferrugata ab.), Coremia ..	121
semiargus (acis), Cyaniris ..	54, 75,	strataria, Biston (Dasyphara) ..	205
76, 77, 78, 90, 96, 107, 116,		striata (exulans ab.), Anthrocera	274
126, 127, 176, 178, 183, 192,		strigata, Nemoria ..	129
194, 207, 217, 221, 278, 279, 284		strigilis, Miana ..	121, 309
semibrunnea (corydon ab.),		strigosa, Hyboma ..	285
Agriades ..	172	Strymon ..	182, 183
semibrunnea, Xylina ..	285	Strymonidi ..	182, 183
semicanis (=phragmitidis), Non-		Strymonidia (Leechia) ..	143
agria ..	289	stygne, Erebia ..	177, 178, 179, 300
semillylus (pamphilus ab.), Cœno-		suasa, Hadena ..	297
nymph ..	121	suavella, Rhodophæa ..	271, 310
semipuparella, Eriocrania ..	105	subalpina, Loweia ..	207, 273
semistriata (exulans ab.), Anthro-		subrosea, Agrotis ..	285
cera ..	274	subsequa, Triphæna ..	227
senex, Nudaria 119, 148, 294, 296, 299		subtusa, Tethea ..	30
serena, Hecatera ..	216	subtusradiata (argiolus ab.), Celas-	
sericea, Lithosia ..	272	trina ..	120, 172
sericealis, Rivula ..	297	suffumata, Cidaria ..	12, 13, 17, 29
seriziata (sericiata), Anthrocera ..	218	suffusa (aurita ab.), Setina ..	149
serratalæ, Hesperia ..	177	suffusa (phæas ab.), Rumicia	
sexalisata, Lobophora ..	298	(Heodes) ..	149
sibylla, Limenitis ..	192, 310	suffusa (psi ab.), Triæna ..	216

PAGE.		PAGE.
suffusella, <i>Phyllocoenistis</i>	249	trifolii, <i>Anthrocera</i> 22, 23, 78, 86, 218, 247, 248, 268, 309
supercavanea (<i>hyale ab.</i>), <i>Colias</i> ..	121	trifolii, <i>Pachygastria</i>
spectata, <i>Dyschorista</i>	272	270, 86
<i>sylvanus</i> , <i>Augiades</i> 77, 78, 126, 137, 246, 279, 280		trigrammica, <i>Grammesia</i>
<i>sylvata</i> (<i>ulmata</i>), <i>Abraxas</i> 23, 84, 86, 272		271
<i>sylvellus</i> , <i>Crambus</i>	64, 280	tripetes (<i>gorge ab.</i>), <i>Erebia</i> 169, 274
<i>sylvius</i> , <i>Cyclopides</i> 14, 15, 30, 31, 33		tripartita (<i>urticæ</i>), <i>Habrostola</i> 18, 30
<i>syringaria</i> , <i>Pericallia</i> (<i>Geometra</i>) 67, 205		triplasia, <i>Habrostola</i>
<i>syringella</i> , <i>Gracilaria</i> 145, 187, 210		30
<i>tages</i> , <i>Nisoniades</i>	75, 78	trisignaria, <i>Eupithecia</i>
<i>tamarisciata</i> , <i>Eupithecia</i> 102, 103, 104, 144		13
<i>taras</i> (<i>malvae ab.</i>), <i>Hesperia</i>	173	tristis (<i>achilleæ ab.</i>), <i>Anthrocera</i> ..
<i>tarsipennalis</i> , <i>Zanclognatha</i> 65, 227		74
<i>tau</i> , <i>Aglaja</i>	78	tristrigella, <i>Lithocolletis</i>
<i>telicanus</i> , <i>Raywardia</i> 140, 143, 173		63
<i>temerata</i> , <i>Bapta</i>	78	tritici, <i>Agrotis</i>
<i>templi</i> , <i>Dasyphoria</i>	18, 285	13, 297
<i>terroraria</i> (<i>hirtaria ab.</i>), <i>Biston</i> ..	121	tritophus, <i>Notodontidae</i>
<i>tersata</i> , <i>Phibalopteryx</i>	228	147
<i>tesseradactyla</i> (<i>fischeri</i>), <i>Fredericina</i> 195		troilus, <i>Euphaeades</i> (<i>Papilio</i>) 254, 255
<i>testata</i> , <i>Cidaria</i>	18, 29, 62, 298	truncata, <i>Dysstroma</i> (<i>Cidaria</i>) ..
<i>testudo</i> , <i>Cochlidion</i>	64	143
<i>tetradactyla</i> , <i>Merrifieldia</i> <i>see tri-</i> <i>dactyla</i> , M.		<i>turionana</i> , <i>Retinia</i>
<i>thadia</i> (<i>florella ab.</i>), <i>Catopsilia</i> ..	22	210
<i>Thaïs</i>	70	<i>turnus</i> (= <i>glauces</i>), <i>Jasoniades</i>
<i>thalia</i> , <i>Strymonidia</i>	143	(<i>Papilio</i>)
<i>thaumas</i> , <i>Adopæa</i> <i>see flava</i> , A.		255
<i>Theclidæ</i>	181	<i>tutti</i> (= <i>stephensi</i>) (= <i>hippocrepidis</i>), <i>Anthrocera</i>
<i>Theclinæ</i> (= <i>Ruralinæ</i>)	183	218
<i>thersamon</i> , <i>Chrysophanus</i>	192	<i>tuttodactyla</i> , <i>Marasmarcha</i> ..
<i>theryi</i> (<i>lavandulæ var.</i>), <i>Anthrocera</i> 218		50, 53
<i>Thestoridi</i>	182	<i>typhæ</i> , <i>Nonagria</i> <i>see arundinis</i> , N.
<i>thompsoni</i> (<i>nebulosa var.</i>), <i>Aplecta</i> 307		289, 290
<i>thore</i> , <i>Brenthis</i>	226	<i>tyndarus</i> , <i>Erebia</i> 107, 150, 173, 179, 190, 193, 194, 206, 273, 301
<i>thrasonella</i> , <i>Glyphipteryx</i>	64	
<i>Thymelicus</i>	16	<i>uliginosellus</i> , <i>Crambus</i>
<i>thymiaria</i> , <i>Hemithea</i>	61	298
<i>tiliae</i> , <i>Mimas</i>	12, 203	<i>ulmiana</i> , <i>Olinda</i>
<i>tiliaria</i> , <i>Ennomos</i>	187	64
<i>tiphon</i> , <i>Cœnonymphia</i> 30, 86, 245, 246, 247, 248, 278, 279, 280		<i>ulmata</i> , <i>Abraxas</i> <i>see sylvata</i> , A.
<i>tipuliformis</i> , <i>Ægeria</i>	11	
<i>tiresias</i> (= <i>alcetas</i>), <i>Everes</i> 233-237		<i>ulmifoliella</i> , <i>Lithocolletis</i>
<i>tithonus</i> , <i>Epinephele</i>	24, 86, 310	105
<i>tithymali</i> (<i>euphorbiæ ab.</i>), <i>Hyles</i> 173		<i>ulvæ</i> , <i>Senta</i> (<i>Nonagria</i>)
<i>tityus</i> , <i>Hemaris</i>	78, 107, 128	289, 296
<i>Tortricidæ</i>	190	<i>unangulata</i> , <i>Melanippe</i>
<i>transalpina</i> , <i>Anthrocera</i> 49, 74, 126, 138, 150, 273		119
<i>transfuga</i> (<i>rubi ab.</i>), <i>Macrothylacia</i> 121		<i>unca</i> , <i>Hydrelia</i>
<i>tranversaria</i> (<i>macularia ab.</i>), <i>Venilia</i>	121	297
<i>tremulifolia</i> , <i>Gastropacha</i>	96	<i>unicolor</i> (<i>arión ab.</i>), <i>Lycæna</i>
<i>trepidaria</i> , <i>Psodos</i>	12, 273	172
<i>triangulum</i> , <i>Noctua</i>	227	<i>unidentaria</i> , <i>Coremia</i>
<i>Tribacis</i>	205	62
<i>Trichoptilus</i>	53, 69	<i>unifasciata</i> , <i>Tortrix</i>
<i>tridactyla</i> (<i>tetradactyla</i>), <i>Merri-</i> <i>fieldia</i> 126, 195, 208, 228, 247		64
		<i>unimaculella</i> , <i>Eriocrania</i>
		105
		<i>unipuncta</i> (<i>orbitulus ab.</i>), <i>Poly-</i> <i>ommatus</i>
		274
		<i>unipuncta</i> (<i>extranea</i>), <i>Leucania</i>
		18, 242, 285
		<i>unita</i> , <i>Lithosia</i>
		221
		<i>Uraptera</i> (<i>Ourapteryx</i>)
		205
		<i>urticæ</i> , <i>Aglais</i> 19, 24, 29, 36, 40, 54, 63, 75, 77, 78, 106, 107, 125, 172, 173, 207, 221, 246,
		275, 278
		<i>valligera</i> , <i>Agrotis</i> <i>see vestigialis</i> , A.
		13
		<i>varia</i> , <i>Melitæa</i>
		195, 301
		<i>varians</i> <i>hybr.</i> , <i>Smerinthus</i>
		203
		<i>varians</i> (<i>inversa</i>) <i>hybr.</i> , <i>Smerin-</i>
		<i>thus</i>
		203
		<i>variata</i> , <i>Thera</i>
		62
		<i>varleyata</i> (<i>grossulariata</i> <i>var.</i>),
		<i>Abra</i>
		242, 243, 310
		<i>velleda</i> , <i>Hepialus</i>
		18
		<i>venosa</i> , <i>Arsilonche</i>
		297
		<i>verbasci</i> , <i>Cucullia</i>
		119, 121

	PAGE.		PAGE.
veris <i>hybr.</i> , <i>Gastropacha</i> ..	96	assoi (glabra <i>var.</i>), <i>Gampsocleis</i> ..	142
vernaria, <i>Geometra</i> ..	61, 128	asturiensis, <i>Steropleurus</i> ..	59, 110
versicolora, <i>Dimorpha</i> ..	.. 145	azami, <i>Dolichopoda</i> ..	.. 259
verticalis, <i>Botys</i> ..	.. 141	Bætica ..	.. 198
vespertilio, <i>Thaumus (Phryxus)</i>	173, 204	balearica, <i>Steropleurus</i> ..	.. 59, 111
vestigialis (valligera), <i>Agrotis</i> ..	13	bicolor, <i>Platycleis</i> ..	.. 118
vetulata, <i>Scotobia</i> ..	.. 297	bicolor, <i>Stauroderus</i> ..	275, 276
vetusta, <i>Calocampa</i> ..	.. 29	biguttulus, <i>Stauroderus</i> ..	.. 118
viburniana, <i>Tortrix</i> ..	64	bipunctatus, <i>Tettix</i> ..	.. 277
viciae (achillea <i>ab.</i>), <i>Anthrocera</i> 73, 74		bolivari, <i>Callicrania</i> ..	196, 197
victoriae, <i>Troides (Ornithoptera)</i> 72, 172		bolivari, <i>Pycnogaster</i> ..	200, 257
villica, <i>Arctia</i> ..	.. 66, 86	bormansi, <i>Dolichopoda</i> ..	.. 259
viminalis, <i>Cleoceris</i> ..	20, 227, 297	brachyptera, <i>Platycleis</i> ..	.. 277
viminetella, <i>Coleophora</i> ..	.. 105	brevipes, <i>Pycnogaster</i> ..	200, 257
vinula, <i>Dicranura (Cerura)</i> ..	17, 192, 210, 211, 253, 270	brunneri, <i>Steropleurus</i> ..	60, 112
virellata (pruinata <i>var.</i>), <i>Pseudoterpnæ</i> ..	121	buergeri, <i>Gampsocleis</i> ..	.. 143
virgata (euryale <i>ab.</i>), <i>Erebia</i> ..	206	cærulescens, <i>Edipoda</i> ..	.. 118
virgata (pronoë <i>ab.</i>), <i>Erebia</i> ..	206	Callicrania ..	.. 195
virgaureæ, <i>Heodes (Chrysophanus)</i>		castellana, <i>Steropleurus</i> ..	60, 112
54, 55, 98, 107, 125, 127,		catalaunica, <i>Steropleurus</i> ..	58, 60
136, 137, 138, 150, 181,		cavannæ, <i>Steropleurus</i> ..	58, 60
193, 195, 207, 212, 301		cavicolus, <i>Troglophilus</i> ..	.. 259
virgaureæ, <i>Coleophora</i> ..	243, 310	*cinereus, <i>Thamnotrizon</i> ..	118, 277
virginiensis (huntera), <i>Pyrameis</i> ..	122	citrinum, <i>Acridium</i> ..	.. 82
virgularia (incanaria), <i>Acidalia</i>		Conocephalidae ..	.. 16
61, 65, 86, 119		Conocephalini ..	.. 16, 17
vulgata, <i>Eupithecia</i> ..	.. 61	Conocephalus ..	.. 16, 17
viridana, <i>Tortrix</i> ..	.. 210	*coronata, <i>Steropleurus</i> ..	.. 110
viridata (aria), <i>Nemoria</i> ..	128-135, 243	cucullatus, <i>Pycnogaster</i> ..	200, 257
viridella, <i>Adela</i> ..	.. 105	Cyrtacanthacris ..	.. 82
vitellina, <i>Leucania</i> ..	.. 271	danicus, <i>Pachytalus</i> ..	.. 118
w-album, <i>Chattendenia</i> ..	143, 159-	dorsale, <i>Xiphidium</i> ..	17, 118, 277
	162, 182, 183, 186	dorsalis, <i>Chorthippus</i> ..	.. 118
walteri (wetteri <i>by error</i>) <i>mongr.</i>		durieui, <i>Uromenus</i> ..	.. 58
Phryxus ..	204, 311	Ectobia ..	.. 117
wavaria, <i>Acidalia</i> ..	.. 298	elegans, <i>Chorthippus</i> ..	.. 276
wetteri (<i>rect.</i> walteri) <i>mongr.</i>		elegans, <i>Steropleurus</i> ..	59, 60, 113
Phryxus ..	204, 311	Euconocephalus ..	.. 16
wolfensbergeri (maturna <i>ab.</i>), <i>Melitæa</i> 54		finoti, <i>Pycnogaster</i> ..	199, 200
xanthographa, <i>Noctua</i> ..	.. 24	fischeri, <i>Stenobothrus</i> ..	.. 276
xanthomelas, <i>Eugonia</i> ..	.. 172	*flavicornæ, <i>Acridium</i> ..	.. 82
xanthomista, <i>Polia</i> ..	.. 285	flavovittatus, <i>Steropleurus</i> ..	.. 112
xylostella, <i>Cerostoma</i> ..	.. 104	fuscum, <i>Xiphidium</i> ..	.. 118
zermattensis (virgaureæ <i>var.</i>),		Gampsocleis ..	.. 142
Heodes (Chrysophanus) ..	207	geniculata, <i>Dolichopoda</i> ..	259, 260
ziczac, <i>Notodonta</i> ..	.. 253, 296	glabra, <i>Gampsocleis</i> ..	118, 142
zophodactyla, <i>Adkinia</i> ..	.. 176	graellsi, <i>Pycnogaster</i> ..	199, 200
Zygæna = <i>Anthrocera</i> ..	.. 218	*gratiosa, <i>Gampsocleis</i> ..	.. 143

ORTHOPTERA.

Names marked * are synonyms.

abbreviata, <i>Gampsocleis</i> ..	.. 142
acanthopygia, <i>Chelidurella</i> ..	.. 117
Acridium ..	.. 81, 82
acuminata, <i>Euconocephalus</i> ..	.. 16
ægyptium, <i>Acridium</i> ..	.. 82
Agroecini ..	.. 16, 17
albipennis, <i>Apterygida</i> ..	.. 117, 275
andalusica, <i>Steropleurus</i> ..	.. 60, 112
annaæ, <i>Gampsocleis</i> ..	.. 142
annaæ, <i>Steropleurus</i> ..	.. 59, 110

	PAGE.		PAGE.
maculatus, <i>Gomphocerus</i> ..	277	serrata, <i>Saga</i> ..	258
*mandibularis, <i>Conocephalus</i> ..	16	sericauda, <i>Barbitistes</i> ..	118
martinezii, <i>Platystolus</i> ..	199	siculus, <i>Steropleurus</i> ..	59, 110
martorelli, <i>Steropleurus</i> ..	59, 111	spinulosa, <i>Gampsocleis</i> ..	142
miegi, <i>Callicrania</i> ..	196, 198	stali, <i>Steropleurus</i> ..	59, 111
mikado, <i>Gampsocleis</i> ..	143	Steropleurus ..	58
minor, <i>Labia</i> ..	230, 305	stigmaticus, <i>Stenobothrus</i> ..	118
*monticola, <i>Callicrania</i> ..	196	striatus, <i>Conocephalus</i> ..	17
*mutsohito, <i>Gampsocleis</i> ..	143	stridulus, <i>Psophus</i> ..	118
Neconocephalus ..	16	subtilis, <i>Conocephalus</i> ..	17
nitrogeniculatus, <i>Stenobothrus</i> ..	276	subulatus, <i>Neconocephalus</i> ..	16
nitidulus, <i>Homocoryphus</i> ..	17	subulatus, <i>Tettix</i> ..	277
nivea, <i>Panchlora</i> ..	148	surcularius, <i>Platystolus</i> ..	199
nobrei, <i>Steropleurus</i> ..	59, 111	Synephippius ..	(note) 197
obseura, <i>Gampsocleis</i> ..	143	tamerlana, <i>Gampsocleis</i> ..	143
obsoleta, <i>Steropleurus</i> ..	59, 110	tataricum, <i>Acridium</i> ..	82
obvia, <i>Callicrania</i> ..	196	tetrus, <i>Conocephalus</i> ..	17
Orchelimum ..	17	Tettix ..	230
ortegai, <i>Steropleurus</i> ..	59, 110	Troglophilus ..	259
pachygaster, <i>Præephippigera</i> ..	198	ultimus, <i>Conocephalus</i> ..	17
palpata, <i>Dolichopoda</i> ..	259, 260	Uromenus ..	58
panzeri, <i>Ectobia</i> ..	275, 276	ustulata, <i>Bætica</i> ..	198
parallelus, <i>Chorthippus</i> ..	275, 276	vagans, <i>Omocestus</i> ..	118, 275, 276
pellucida, <i>Callierania</i> ..	196, 197	varium, <i>Meconema</i> ..	277
peregrina, <i>Schistocerca</i> ..	82	vittata, <i>Saga</i> ..	259
perezi, <i>Steropleurus</i> ..	59, 111	viridissima, <i>Locusta</i> ..	277
Phyllium ..	94	verrucivorus, <i>Decticus</i> ..	118, 277
Platephippius ..	198 note.	vitium, <i>Ephippigera</i> ..	118
Platystolus ..	198	Xiphidiini ..	16, 17
podolica, <i>Gampsocleis</i> ..	142	zelleri, <i>Ephippigera</i> ..	113
polita, <i>Steropleurus</i> ..	59, 111, 113		
Præephippigera ..	198		
pseudola, <i>Steropleurus</i> ..	60, 112		
punctatissima, <i>Leptophyes</i> ..	277		
Pycnogaster ..	199		
ramburi, <i>Callicrania</i> ..	196		
religiosa, <i>Mantis</i> ..	117		
reticauda, <i>Gampsocleis</i> ..	142		
rhombifolia, <i>Dorylæa</i> ..	22		
riparia, <i>Labidura</i> ..	117		
roeselii, <i>Platycleis</i> ..	118, 277		
roseum, <i>Acridium</i> ..	82		
ruficorne, <i>Acridium</i> ..	82		
rufipes, <i>Omocestus</i> ..	275, 276		
rufus, <i>Gomphocerus</i> ..	118, 276		
rugosicollis, <i>Uromenus</i> ..	58		
Saga ..	258		
sanchez-gomezi, <i>Pycnogaster</i> ..	199, 257		
*scabricollis, <i>Steropleurus</i> ..	112		
Schistocerca ..	82		
*selliger, <i>Callicrania</i> ..	197		
seoanei, <i>Callicrania</i> ..	196, 197		
serrata, <i>Callierania</i> ..	196, 197		

ODONATA.

Anax ..	306
cærulescens, <i>Orthetrum</i> ..	269
curtisi, <i>Oxygastra</i> ..	148
depressa, <i>Libellula</i> ..	269
flaveolum, <i>Sympetrum</i> ..	216
fonscolombii, <i>Sympetrum</i> ..	269
fulva, <i>Libellula</i> ..	269
imperator, <i>Anax</i> ..	269, 306
isosceles, <i>Æschna</i> ..	269
metallica, <i>Somatochlora</i> ..	269
prænubila (quadrimaculata var.),	
<i>Libellula</i> ..	307
quadrimaculata, <i>Libellula</i> ..	216,
	269, 306, 307
scoticum, <i>Sympetrum</i> ..	306

THYSANURA.

vesiculosus, <i>Anajapyx</i> ..	69
---------------------------------	----

TRICHOPTERA.

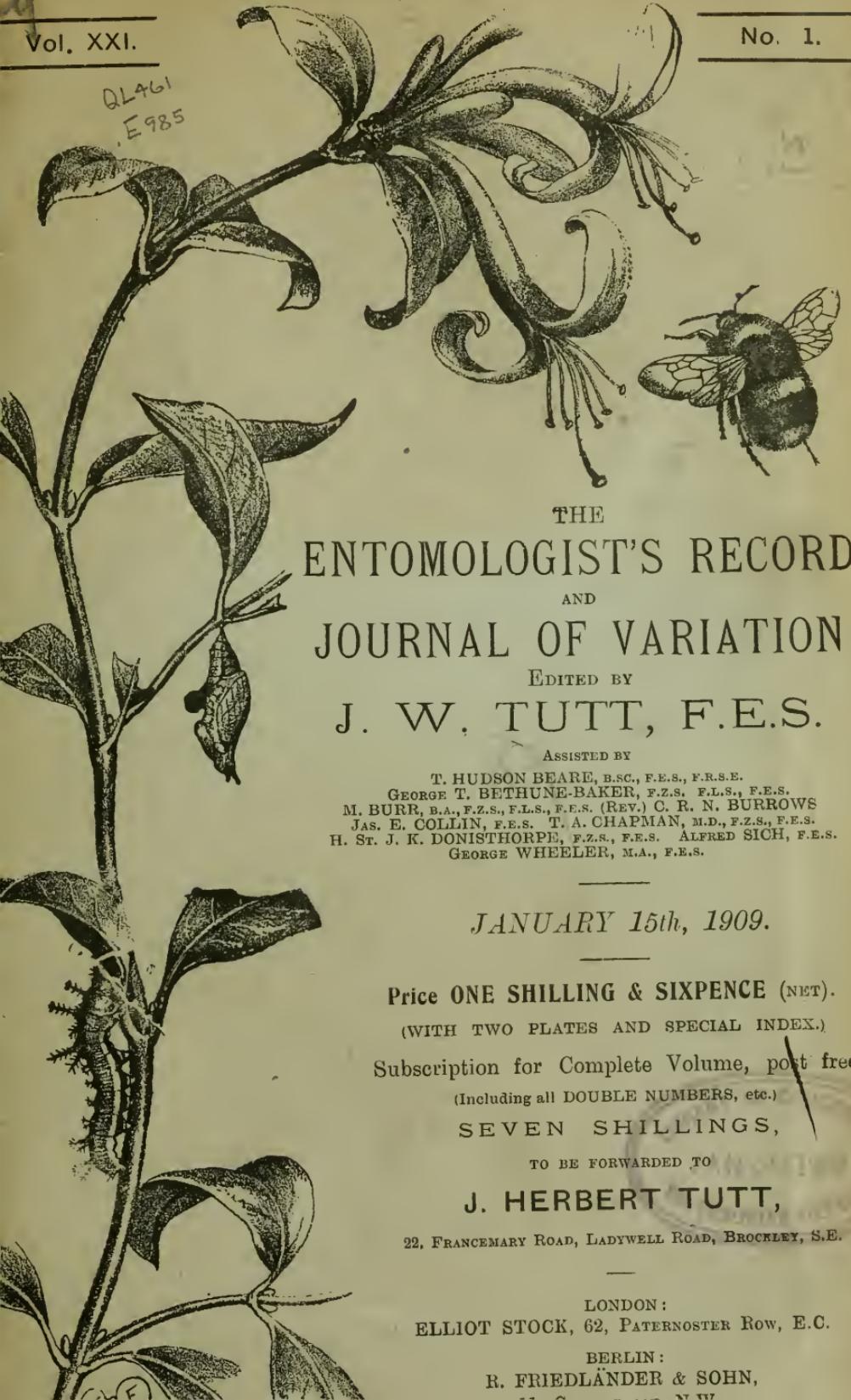
grandis, <i>Phrygania</i> ..	306
------------------------------	-----

Subscriptions for Vol. XXI are now due.

Vol. XXI.

No. 1.

QL461
E985



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.S.C., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

JANUARY 15th, 1909.

Price ONE SHILLING & SIXPENCE (NET).

(WITH TWO PLATES AND SPECIAL INDEX.)

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYWELL ROAD, BROCKLEY, S.E.

LONDON:
ELLIOT STOCK, 62, PATERNOSTER Row, E.C.

BERLIN:
R. FRIEDLÄNDER & SOHN,
11, GROSSE-ERDMÜHLE, N.W.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., **Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order. } 5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

**ADDRESS.—“ Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.**

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

TEMPORARY NOTICE.

The Back Volumes (I-XX) of *The Entomologist's Record*, &c., can be obtained at 6s. per Volume. Complete set of 20 vols. £4 net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII., XIX. and XX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at the published price (plus postage) from 119, Westcombe Hill, Blackheath, S.E. [For detailed notice see advt. on back cover.]

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—*Cervinaria**, *Dictaea**. Desiderata.—*Rubricollis*, *Albicolon*, *Cursoria*, *Sylvata*, *Hb.*—*B. A. Bower*, *Langley*, *Willow Grove*, *Chislehurst*.

Duplicates.—*Cilialis*, *Margaritellus*, *Phragmitellus*, *Hastiana*, *Kühniella*, *Ophthal-*

micana, Funerella, Alternana. *Desiderata*.—Pyrales, Crambides, Tortrices.—*T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.*

Duplicates.—Hectus, Lunaria, Cæsiata, Olivata, Apiciaria, Badiata, * Autumnata, * Decolorata, Affinitata, Fumata, Tristata, Cambria, Trifasciata (dark), Centaureata, Subnotata, Isogrammata, * Subfulvata and *ab. oxydata*, Succenturiata (6), Bicolorata *ab. plumbata*. *Desiderata*.—Flavicinctata, Consignata, Pygmæata, Minutata, Viridata, Virgaureata, Expallidata, Sexualisata, Obscureata, and many others.—*T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.*

WANTED.—We require very badly the loan of a pupal shell or dead pupa of *Lycena minimus* for description, and shall be pleased to return it as soon as done with.—*J. W. Tutt, 119, Westcombe Hill, Blackheath, S.E.*

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—*J. W. H. Harrison, 181, Abingdon Road, Middlesbrough, England.*

WANTED.—Indian Theclas, Chrysopanids, and Lycaenids. Offered—Palæarctic and Nearctic species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesbrough.*

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British “Blues,” for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—January 20th (Annual Meeting).

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. January 28th (Annual Meeting at 7 p.m.).

North London Natural History Society, The Amherst Club, Amhurst Road, N.—Meetings. [No notices received.]

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

The Entomologist's Library.

Books written by **J. W. TUTT, F.E.S.**

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the “pugs.”

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

Postal Orders to be addressed to **J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

British Lepidoptera.

TUESDAY, January 26th, at 1 o'clock,

Mr. J. C. Stevens,

Will SELL by AUCTION, at his rooms, 38, KING STREET, COVENT GARDEN,
London, W.C., the

Collection of British Macro- and Micro- Lepidoptera,

Formed by C. H. SCHILS, Esq., including several fine specimens of *C. dispar*, *N. subrosea*, *L. coenosa*, and other rare and extinct species, together with the Two Forty-drawer Cabinets in which they are contained.

Also the **COLLECTION OF BRITISH LEPIDOPTERA**, mostly in very fine condition, formed by A. M. SMALLPIECE, Esq., containing some important varieties and some fine *C. exulis*, together with the Mahogany Cabinets in which the collection is contained. Also other small collections of British and Exotic Lepidoptera, Coleoptera, etc., from other sources.

On view day prior 10 to 4 and morning of sale. Catalogues on application.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

**Price 6s. each volume, net, or 17s. 6d. for the three
parts.**

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvae," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædia from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR.—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Important Sale of British Lepidoptera.

Mr. J. C. Stevens,

Begs to announce that the first portion of the

Collection of British Lepidoptera

Formed by the late

T. MADDISON, Esq., F.E.S.

(well known by the number of valuable varieties which it contains), will be OFFERED for SALE by AUCTION in February.

Catalogues ready one week prior to sale, may be had on application to the Auctioneer, 58, King Street, Covent Garden, London, W.C.

THE THIRD VOLUME

OF

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES,

THEIR WORLD-WIDE VARIATION AND GEOGRAPHICAL DISTRIBUTION.

By J. W. TUTT, F.E.S.,

The **third volume** of the above standard work, *fully and profusely illustrated*, will be published in **20 parts**, at **1s.** per part. These parts will contain a *monographic revision of the British "blue" butterflies*, confessedly the most difficult group of butterflies to deal with biologically, represented in the British Isles. For this work *life-histories* of each British species have been worked out at length, and *photographs of the different stages* of almost every species *made from life*.

Two parts of this new volume have now been published, dealing in the Preliminary Chapters with "The Family-habits in the Chrysopanid Larvæ," and "The Family-habits in the Skipper Larvæ," and in the Systematic part with "Everes argiades," the rarest of British butterflies.

The work will be fully and profusely illustrated. So much recent discovery has been made in the structural characters of the "blue" butterflies, that it is possible to illustrate this as no other work has been illustrated. It will contain not only full-page illustrations of the life-histories of the different species dealt with, but details of structure quite new, and now published for the first time.

To do this, however, to the fullest extent will require real support from all lepidopterists who really make a scientific study of Butterflies. This part of the work will, of course, be as valuable to Continental and American as to British lepidopterists.

Subscribers for the 20 parts (in the last volume these extended to 25 parts at the same subscription price) is fixed at **17s. 6d.**, which must be paid direct to *J. Herbert Tutt*. Copies bought through the booksellers must be paid for at their face value per number. *To ensure delivery as soon as published, subscriptions should be sent direct*, and the following (or a similar) covering note forwarded therewith:—

Please enter my name as a subscriber for the new series of 20 parts of *A Natural History of the British Butterflies*, for which I enclose postal order for 17s. 6d.

Name.....

Address.....

Date.....

J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennae 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Notes on the Zygænidæ.

By J. W. TUTT, F.E.S.

PRICE ONE SHILLING AND SIXPENCE.

(Containing an account of the newly-discovered British species.)

Chapter I. *Zygaena eulans* and its varieties.

Chapter II. *Zygaena carniolica* and its varieties.

Chapter III. *Zygaena achilleae* and its varieties.

Chapter IV. *Zygaena transalpina* and its varieties.

Chapter V. *Zygaena medicaginis* and its varieties.

Chapter VI. *Zygaena ochsenheimeri*.

Postal Orders to A. H., 41, Wisteria Road, Lewisham, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

NOTICE.

GREAT REDUCTION IN PRICE.

Our offer, made last month, to supply for a time the back volumes of the *Ent. Record* at a very much lower rate than has been possible hitherto, has evidently proved attractive and given general satisfaction except to those who became subscribers two, three, or four years ago, and who consequently do not care to pay as much for 16, 17, 18, or 19 volumes, as for 20. In order to meet this objection we offer until the next issue (or so long as the stock lasts), complete sets of—

The Entomologist's Record and Journal of Variation (Vols. I-XX).

At the greatly reduced price of £4, that is, at the rate of 4s. per volume. Single, two, or three back volumes at 6s. per volume; four, or five at 5s. 9d. per volume; any six, seven, eight, or nine volumes at 5s. 6d. per volume; ten, eleven, twelve, thirteen, or fourteen volumes at 5s. per volume; fifteen volumes at 4s. 6d. per volume; sixteen or seventeen at 4s. 4d. per volume; eighteen at 4s. 3d.; nineteen at 4s. 2d. per volume. [Any number below four at the price of a single volume.] Odd copies of the Magazine at published price (plus postage).

To obtain this concession the number of volumes must be ordered at one time. The offer is merely temporary and will soon be withdrawn. It will give entomologists the chance of obtaining cheaply the finest set of Journals containing details of British and Continental Collecting ever published.

NOTICE ALSO—FURTHER GREAT REDUCTION IN PRICE.

The success of our offer of the back volumes of the *Ent. Record* at a reduced price, in order to enable our later subscribers to possess themselves of a complete set of this most useful Journal, leads us to make also, temporarily, an offer to our more recent subscribers to our large work—

A Natural History of the British Lepidoptera.

In order to enable entomologists to complete their series of this reference book we offer (until our next issue) the volumes at the following great reduction: For any single volume 15s.; for two volumes 14s. 6d. per volume; for three volumes 14s. per volume; for four volumes 13s. 6d. per volume; for five volumes 13s. per volume; for six volumes 12s. 6d. per volume; or the whole set of seven volumes for £4 4s. (i.e., at the rate of 12s. per volume).

This offer, which is considerably lower than the price the work fetches in Stevens' sale-rooms, is quite temporary, and is only made to enable those entomologists who do not feel that they can afford to complete their sets at £1 per volume, to do so at this cheaper rate.

We also offer, in order to allow entomologists to complete their sets of—

The British Noctuae and their Varieties,

the following reductions: For any single volume 6s.; for any two volumes 5s. 6d. per volume; for any three volumes 5s. per volume; for the complete set of four volumes 18s. (i.e., 4s. 6d. per volume).

The other three works that complete our series of scientific entomological books we offer for one month only at three-fifths price, *viz.* :—

Migration and Dispersal of Insects	-	-	-	3s.
Melanism and Melanochroism in Lepidoptera	-	-	-	3s.
Monograph of the British Pterophorina	-	-	-	3s.

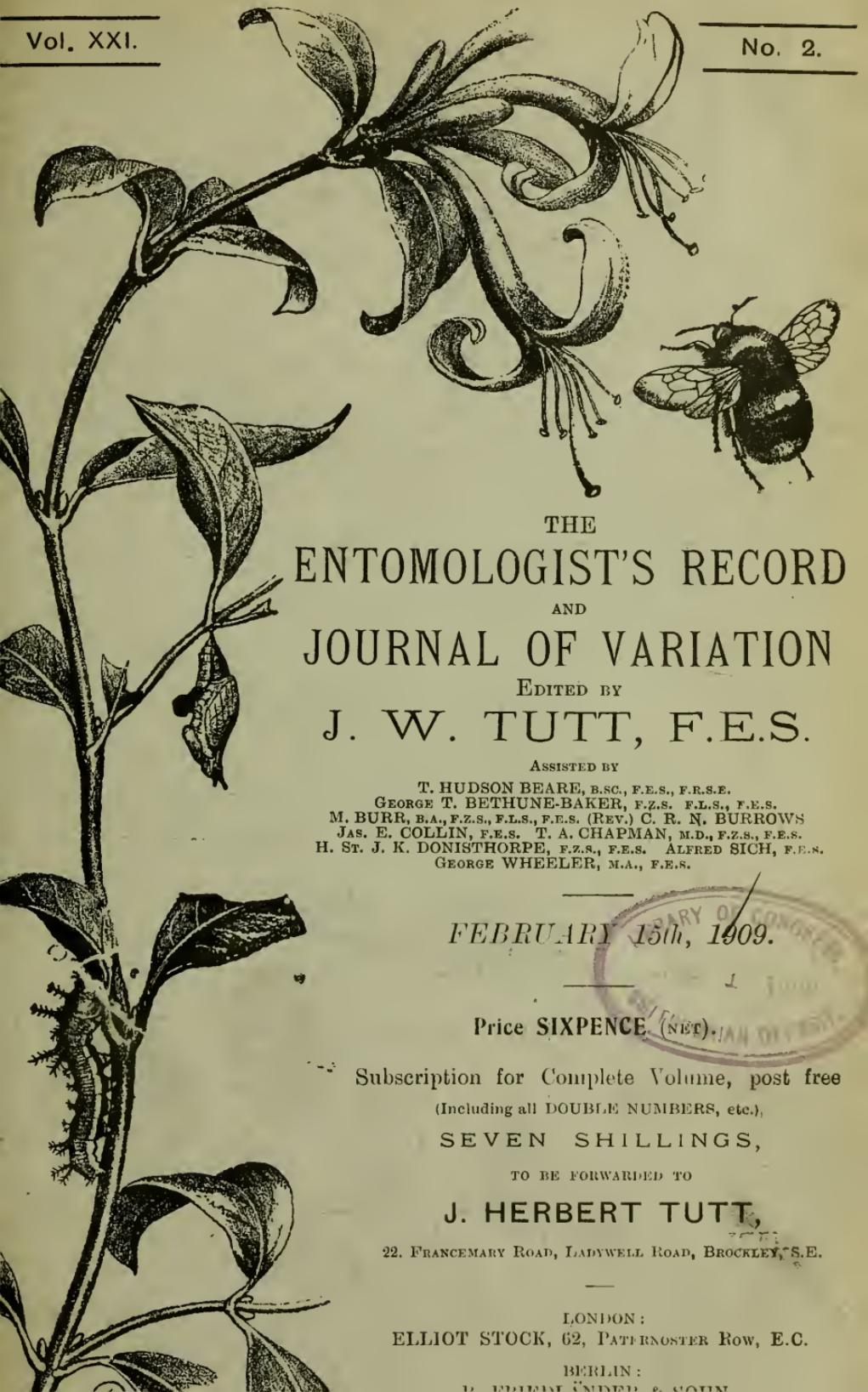
Postal Orders or Cheques with Order to—

J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

Subscriptions for Vol. XXI are now due.

Vol. XXI.

No. 2.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.S.C., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S. F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

—
FEBRUARY 15th, 1909.

Price SIXPENCE (NET).

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.),
SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22. FRANCEMARY ROAD, LADYWELL ROAD, BROCKLEY, S.E.

LONDON :
ELLIOT STOCK, 62, PATRONOSTER ROW, E.C.

BERLIN :

P. ERHARD UND S. SOHN

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

**D. F. TAYLER & Co., Ltd.,
Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! ! ! LABELS !! ! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as received. Remittance in full must accompany each order. } 5/-

Rannoch New Forest Shetland
16. vi. 97 4. ix. 97 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road, Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

TEMPORARY NOTICE.

The Back Volumes (I-XX) of *The Entomologist's Record, &c.*, can be obtained at 6s. per Volume. Complete set of 20 vols. £4 net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII., XIX. and XX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at the published price (plus postage) from 119, Westcombe Hill, Blackheath, S.E. [For detailed notice see advt. on back cover.]

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record, &c.*, are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—H. ruficollis, lineatacollis, L. obscurus, H. picipes, planus, palustris, A. nebulosus, conspersus, sturmi, I. ater, fenestratus, R. notatus, D. marginatus, circumflexus, H. piceus, P. intermedius, G. vernalis, C. auratus, Alphitobius (both), Tenebrio (both), P. coriarius ♀. Desiderata.—Astynomus ædilis.—F. Milton, 22, Granby Street, Bethnal Green, E.

Duplicates.—Cervinaria*, Dictæa*. Desiderata.—Rubricollis, Albicolon, Cursoria, Sylvata, Hb.—B. A. Bower, Langley, Willow Grove, Chislehurst.

Duplicates.—Ciliialis, Margaritellus, Phragmitellus, Hastiana, Kühniella, Ophthal-

micana, Funerella, Alternana. *Desiderata*.—Pyrales, Crambides, Tortrices.—*T. Ashton Loftouse, The Croft, Linthorpe, Middlesbrough*.

Duplicates.—*Hectus, Lunaria, Cæsiata, Olivata, Apiciaria, Badiata, Autumnata, Decolorata, Affinitata, Fumata, Tristata, Cambria, Trifasciata (dark), Centaureata, Subnotata, Isogrammata, Subfulvata and ab. oxydata, Succenturiata (6), Bicolorata ab. plumbata.* *Desiderata*.—*Flavincinctata, Consignata, Pygmæata, Minutata, Viridata, Virgaureata, Expallidata, Sexualisata, Obscurata, and many others.*—*T. Ashton Loftouse, The Croft, Linthorpe, Middlesbrough*.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England*.

WANTED.—Indian Theclas, Chrysopanids, and Lyceenids. Offered—Palaearctic and Nearctic species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'*.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath*.

CHANGE OF ADDRESS.—*A. W. Bacot to York Cottages, York Hill, Loughton, Essex.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—March 3rd, 17th; April 7th; May 5th; June 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings—March 1st, "Fruits and Seeds," Hugh Main, B.Sc. April 5th, "Wanderings in the Savoy," R. Paulson, F.R.M.S. May 3rd, Exhibition Meeting. Excursions—February 20th, Natural History Museum, South Kensington (Entrance Hall, 2.30 p.m.). March 6th, The College of Surgeons (at the College at 2.30 p.m.). May 1st, Excursion to Hayes, Kent (2.25 p.m. train from Cannon Street).—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. March 11th, Lecture by Mr. J. W. Tutt, "A gossip about the Blue Butterflies." It is anticipated that many of our leading entomologists will exhibit their series of Lycaenids, as well as photos of the early stages, or complete life-histories. [All entomologists cordially invited both to attend and to exhibit their series of these butterflies.]

North London Natural History Society, The Amherst Club, Amburst Road, N.—Meetings. [No notices received.]

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

The Entomologist's Library.

Books written by J. W. TUTT, F.E.S.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Stray Notes on the Noctuae. Price 1s. net. An account of the classification of the Noctuid moths, etc.

Postal Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

STEVENS' AUCTION ROOMS, ESTD. 1760.

IMPORTANT SALE OF

British Lepidoptera.

TUESDAY & WEDNESDAY, 23rd & 24th February, at 1 o'clock,

Mr. J. C. Stevens,

Will OFFER for SALE by AUCTION, at his rooms, 38, KING STREET, COVENT GARDEN, London, W.C., the First Portion of the valuable and extensive

Collection of British Lepidoptera,

Formed by the late

T. MADDISON, Esq., F.E.S.

Comprising the Rhopalocera and the Sphinges and Bombyces. The collection is particularly rich in Rare and Extinct Species, **remarkable varieties**, and Hermaphrodite and Gynandromorphous Specimens. Catalogues in course of preparation.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on swallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-bunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for 17s. 6d.

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

GREAT SALE OF SURPLUS PUP

In fine condition, with data.

P. brassicæ, 6d.; S. populi, 1s. 3d.; Elpenor, 2s. 6d.; Jacobææ, 6d.; Falcula, 7d.; Lacertula, 11d.; Palpina, 1s. 2d.; Camelina, 10d.; Carmelita, 5s.; Dictæa, 1s. 3d.; Ziczac, 1s. 4d.; Ziczac (fine Scotch form), 2s. 2d.; Conpersa (Shetlands), 16s.; Hirtaria, 9d.; Orbicularia, 2s. 3d.; Albicillata, 1s. 2d.; Tristata, 1s. 10d.; Albulata var. Thules (Shetlands), 2s. 10d.; Silacea, 2s. 5d.—all per dozen. Not less than one dozen of a species supplied. Full price list on application.

L. W. NEWMAN, Bexley, Kent.

THE THIRD VOLUME OF A NATURAL HISTORY OF THE BRITISH BUTTERFLIES,

THEIR WORLD-WIDE VARIATION AND GEOGRAPHICAL DISTRIBUTION.

By J. W. TUTT, F.E.S.,

The third volume of the above standard work, *fully and profusely illustrated*, will be published in 20 parts, at 1s. per part. These parts will contain a monographic revision of the British "blue" butterflies, confessedly the most difficult group of butterflies to deal with biologically, represented in the British Isles. For this work life-histories of each British species have been worked out at length, and photographs of the different stages of almost every species made from life.

Two parts of this new volume have now been published, dealing in the Preliminary Chapters with "The Family-habits in the Chrysophanid Larvæ," and "The Family-habits in the Skipper Larvæ," and in the Systematic part with "Everes argiades," the rarest of British butterflies.

The work will be fully and profusely illustrated. So much recent discovery has been made in the structural characters of the "blue" butterflies, that it is possible to illustrate this as no other work has been illustrated. It will contain not only full-page illustrations of the life-histories of the different species dealt with, but details of structure quite new, and now published for the first time.

To do this, however, to the fullest extent will require real support from all lepidopterists who really make a scientific study of Butterflies. This part of the work will, of course, be as valuable to Continental and American as to British lepidopterists.

Subscribers for the 20 parts (in the last volume these extended to 25 parts at the same subscription price) is fixed at 17s. 6d., which must be paid direct to J. Herbert Tutt. Copies bought through the booksellers must be paid for at their face value per number. To ensure delivery as soon as published, subscriptions should be sent direct, and the following (or a similar) covering note forwarded therewith:—

Please enter my name as a subscriber for the new series of 20 parts of *A Natural History of the British Butterflies*, for which I enclose postal order for 17s. 6d.

Name.....

Address.....

Date.....

J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal) 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennae 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Notes on the Zygænidæ.

By J. W. TUTT, F.E.S.

PRICE ONE SHILLING AND SIXPENCE.

(Containing an account of the newly-discovered British species.)

Chapter I. *Zygaena exulans* and its varieties.

Chapter II. *Zygaena carniolica* and its varieties.

Chapter III. *Zygaena achilleae* and its varieties.

Chapter IV. *Zygaena transalpina* and its varieties.

Chapter V. *Zygaena medicaginis* and its varieties.

Chapter VI. *Zygaena ochsenheimeri*.

Postal Orders to A. H., 41, Wisteria Road, Lewisham, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS. SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

This offer will be withdrawn with the issue of the next number.

NOTICE.

GREAT REDUCTION IN PRICE.

Our offer, made last month, to supply for a time the back volumes of the *Ent. Record* at a very much lower rate than has been possible hitherto, has evidently proved attractive years ago, and who consequently do not care to pay as much for 16, 17, 18, or 19 volumes, and given general satisfaction. We again offer until the next issue (or so long as the stock lasts), complete sets of—

**The Entomologist's Record and Journal of Variation
(Vols. I-XX).**

At the greatly reduced price of £4, that is, at the rate of 4s. per volume. Single, two, or three back volumes at 6s. per volume; four, or five at 5s. 9d. per volume; any six, seven, eight, or nine volumes at 5s. 6d. per volume; ten, eleven, twelve, thirteen, or fourteen volumes at 5s. per volume; fifteen volumes at 4s. 6d. per volume; sixteen or seventeen at 4s. 4d. per volume; eighteen at 4s. 3d.; nineteen at 4s. 2d. per volume. [Any number below four at the price of a single volume.] Odd copies of the Magazine at published price (plus postage).

To obtain this concession the number of volumes must be ordered at one time. The offer is merely temporary and will soon be withdrawn. It will give entomologists the chance of obtaining cheaply the finest set of Journals containing details of British and Continental Collecting ever published.

NOTICE ALSO FURTHER GREAT REDUCTION IN PRICE.

The success of our offer of the back volumes of the *Ent. Record* at a reduced price, in order to enable our later subscribers to possess themselves of a complete set of this most useful Journal, leads us to make also, temporarily, an offer to our more recent subscribers to our large work—

A Natural History of the British Lepidoptera.

In order to enable entomologists to complete their series of this reference book we offer (until our next issue) the volumes at the following great reduction: For any single volume 15s.; for two volumes 14s. 6d. per volume; for three volumes 14s. per volume; for four volumes 13s. 6d. per volume; for five volumes 13s. per volume; for six volumes 12s. 6d. per volume; or the whole set of seven volumes for £4 4s. (i.e., at the rate of 12s. per volume).

This offer, which is considerably lower than the price the work fetches in Stevens' sale-rooms, is quite temporary, and is only made to enable those entomologists who do not feel that they can afford to complete their sets at £1 per volume, to do so at this cheaper rate.

We also offer, in order to allow entomologists to complete their sets of—

The British Noctuae and their Varieties,

the following reductions: For any single volume 6s.; for any two volumes 5s. 6d. per volume; for any three volumes 5s. per volume; for the complete set of four volumes 18s. (i.e., 4s. 6d. per volume).

The other three works that complete our series of scientific entomological books we offer for one month only at three-fifths price, *viz.* :—

Migration and Dispersal of Insects	-	-	-	3s.
Melanism and Melanochroism in Lepidoptera	-	-	-	3s.
Monograph of the British Pterophorina	-	-	-	3s.

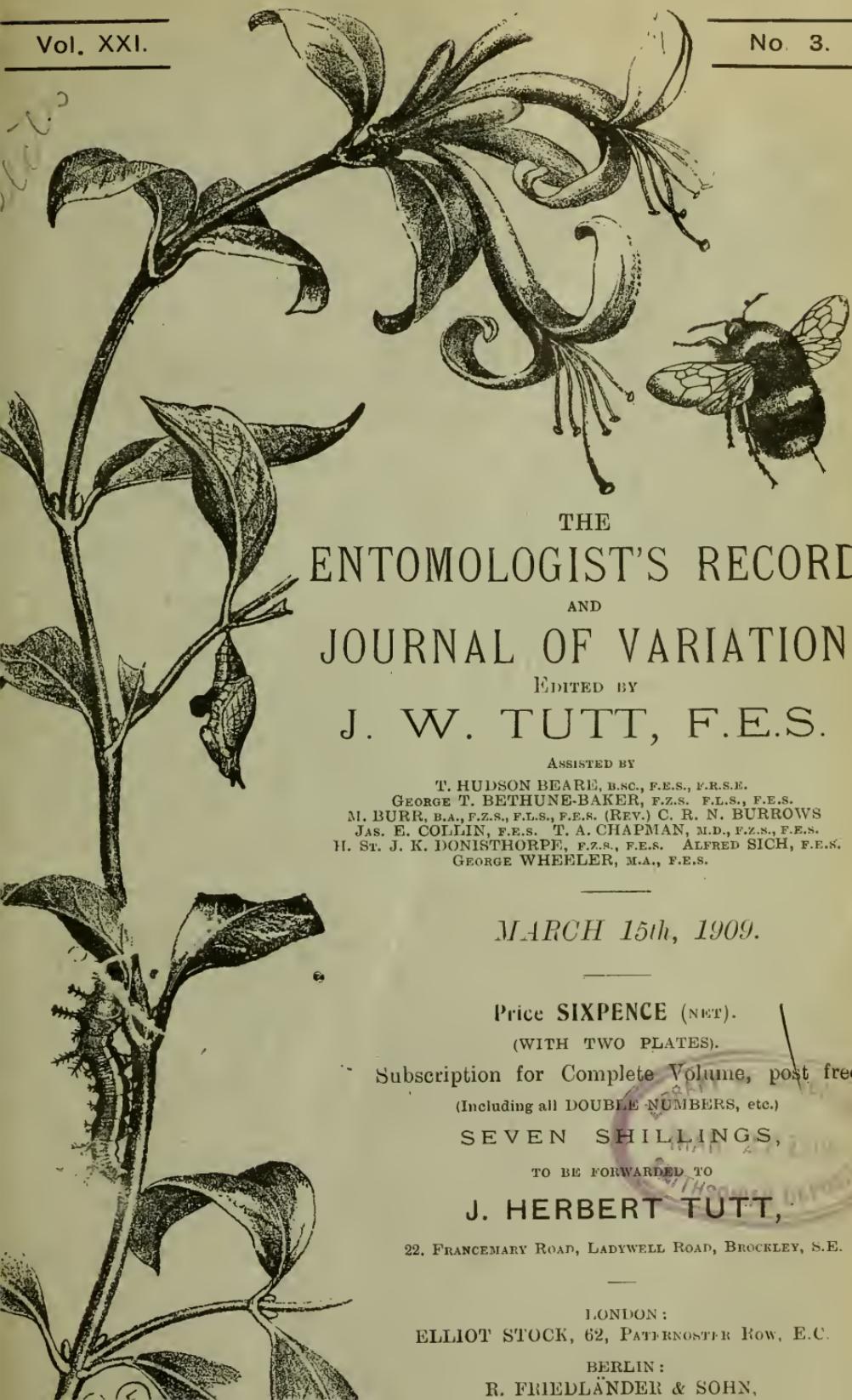
Postal Orders or Cheques with Order to—

J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

Subscriptions for Vol. XXI are now due.

Vol. XXI.

No. 3.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

MARCH 15th, 1909.

Price SIXPENCE (NET).

(WITH TWO PLATES).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22. FRANCEMARY ROAD, LADYWELL ROAD, BROCLEY, S.E.

LONDON:
ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:
R. FRIEDLÄNDER & SOHN,

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

*Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.*

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000

To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as received. Remittance in full must accompany each order.

5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—*Edusa*, *Semele*, *C. rubi*, *Ægon* (vars. ♀), *Batis*, *Derassa*, *Gemina*, *N. rubi*, *Suffusa*, *Saucia*, *Nigra*, *Lichenea*, *Fuscula*, *Lithoriza*, *Petrificata*. *Desiderata*.—*Pupæ*: *Palpina*, *Dictaea*, *Curtula*, *Lunaria*, *Betularia* var. *Doubledayaria*, and many imagines.—*A. J. Spiller*, *Godolphin Cross*, *Helston*.

Duplicates.—*Exulis* (few), *Alpina** (few), *Humuli* var. *Hethlandica*, *Festiva* vars., *Melanopa*, *Immanata*, *Venosata*, *Blandiata*, *Albulata* vars., *Dalella** (in lots of 20 or more), *Atomalis*, *Pinguinalis*, *Rusticana*, *Thuleana* (few); all Shetland 1908. Also *Globulariæ*, and many others. Exchange now or later (will reserve). *Desiderata*.—Very numerous, including many common species for renewal or extension; full list on application.—*B. W. Adkin*, 8, *Hope Park*, *Bromley*, *Kent*.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—J. W. H. *Harrison*, 181, *Abingdon Road, Middlesbrough, England*.

WANTED.—Indian Theclas, Chrysopanidids, and Lycenids. Offered—Palæarctic and Nearctic species.—J. W. H. *Harrison*, 181, *Abingdon Road, Middlesbrough*.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British “Blues,” for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] J. W. *Tutt*, 119, *Westcombe Hill, Blackheath*.

CHANGES OF ADDRESS.—The Hon. N. C. *Rothschild* to *Arundel House, Kensington Palace Gardens, N.* Mr. E. *Broome* to *Box 34, Hamilton, Bermuda*.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, *Chandos Street, Cavendish Square, W.*, 8 p.m. Meetings—March 17th, Discussion on “*Plebeius argus (aegon)* and *P. argyrogynon*,” opened by Mr. J. W. *Tutt*. Fellows and visitors are kindly requested to bring specimens for exhibition. April 7th; May 5th; June 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings—March 1st, “Fruits and Seeds,” Hugh Main, B.Sc. April 5th, “Wanderings in the Savoy,” R. Paulson, F.R.M.S. May 3rd, Exhibition Meeting. Excursions—February 20th, Natural History Museum, South Kensington (Entrance Hall, 2.30 p.m.). March 6th, The College of Surgeons (at the College at 2.30 p.m.). May 1st, Excursion to Hayes, Kent (2.25 p.m. train from Cannon Street).—Hon. Sec., Owen Monk, 8, Shooter’s Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. March 25th, “Exhibition of Lantern Slides”; March 27th, “Visit to the Museum, Tring.” April 8th, “Exhibits and Discussions thereon”; April 22nd, “The Resting Positions of Butterflies and Moths” (Illustrated by lantern), Mr. A. E. Tonge. May 13th, “The Basingstoke Canal,” Mr. E. Step.

North London Natural History Society, The Amherst Club, Amhurst Road, N.—Meetings. [No notices received.]

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

The Entomologist's Library.

Books written by J. W. TUTT, F.E.S.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

Notes on the Zygænidæ. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. 6d. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising *Tephrosia bistortata* and *T. crepuscularia*. Price 2s. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. 6d. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. 6d. net. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palæarctic Psychides. Price 6d. net.

Postal Orders to J. H. *Tutt*, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Collectors who are commencing the Season's work should not fail to refer to **Practical Hints**, day by day, for information as to what can be done in the field every day in the year. Collectors who are going into a new locality, at home or abroad, will find the chapter in the new edition of Part I, "Holiday Collecting," particularly useful.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.
Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage," Instructions on the technical description of "Eggs," "Larvae," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints* Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

GREAT SALE OF SURPLUS PUPÆ

In fine condition, with data.

P. brassicæ, 6d.; S. populi, 1s. 3d.; Elpenor, 2s. 6d.; Jacobææ, 6d.; Falcula, 7d.; Lacertula, 11d.; Palpina, 1s. 2d.; Camelina, 10d.; Carmelita, 5s.; Dietææ, 1s. 3d.; Ziczac, 1s. 4d.; Ziczac (fine Scotch form), 2s. 2d.; Conspersa (Shetlands), 16s.; Hirtaria, 9d.; Orbicularia, 2s. 3d.; Albicillata, 1s. 2d.; Tristata, 1s. 10d.; Albulata var. Thules (Shetlands), 2s. 10d.; Silacea, 2s. 5d.—all per dozen. Not less than one dozen of a species supplied. Full price list on application.

L. W. NEWMAN, Bexley, Kent.

THE THIRD VOLUME OF A NATURAL HISTORY OF THE BRITISH BUTTERFLIES,

THEIR WORLD-WIDE VARIATION AND GEOGRAPHICAL DISTRIBUTION.

By J. W. TUTT, F.E.S.,

The third volume of the above standard work, *fully and profusely illustrated*, will be published in 20 parts, at 1s. per part. These parts will contain a monographic revision of the British "blue" butterflies, confessedly the most difficult group of butterflies to deal with biologically, represented in the British Isles. For this work life-histories of each British species have been worked out at length, and photographs of the different stages of almost every species made from life.

Four parts of this new volume have now been published, dealing in the Preliminary Chapters with "The Family-habits in the Chrysophanid Larvæ," and "The Family-habits in the Skipper Larvæ," and in the Systematic part with "Evers argiades," the rarest of British butterflies, and "Cupido minimus."

The work will be fully and profusely illustrated. So much recent discovery has been made in the structural characters of the "blue" butterflies, that it is possible to illustrate this as no other work has been illustrated. It will contain not only full-page illustrations of the life-histories of the different species dealt with, but details of structure quite new, and now published for the first time.

To do this, however, to the fullest extent will require real support from all lepidopterists who really make a scientific study of Butterflies. This part of the work will, of course, be as valuable to Continental and American as to British lepidopterists.

Subscribers for the 20 parts (in the last volume these extended to 25 parts at the same subscription price) is fixed at 17s. 6d., which must be paid direct to J. Herbert Tutt. Copies bought through the booksellers must be paid for at their face value per number. To ensure delivery as soon as published, subscriptions should be sent direct, and the following (or a similar) covering note forwarded therewith:—

Please enter my name as a subscriber for the new series of 20 parts of *A Natural History of the British Butterflies*, for which I enclose postal order for 17s. 6d.

Name.....

Address.....

Date.....

J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

A COPY (QUITE NEW) OF

Forest Entomology

BY

A. T. GILLANDERS, F.E.S.

For **7s. 6d.** (Published Price **15s.**)

POSTAL ORDER to A. H., 41, WISTERIA ROAD, LEWISHAM, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Fransemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palaearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuae and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera. Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

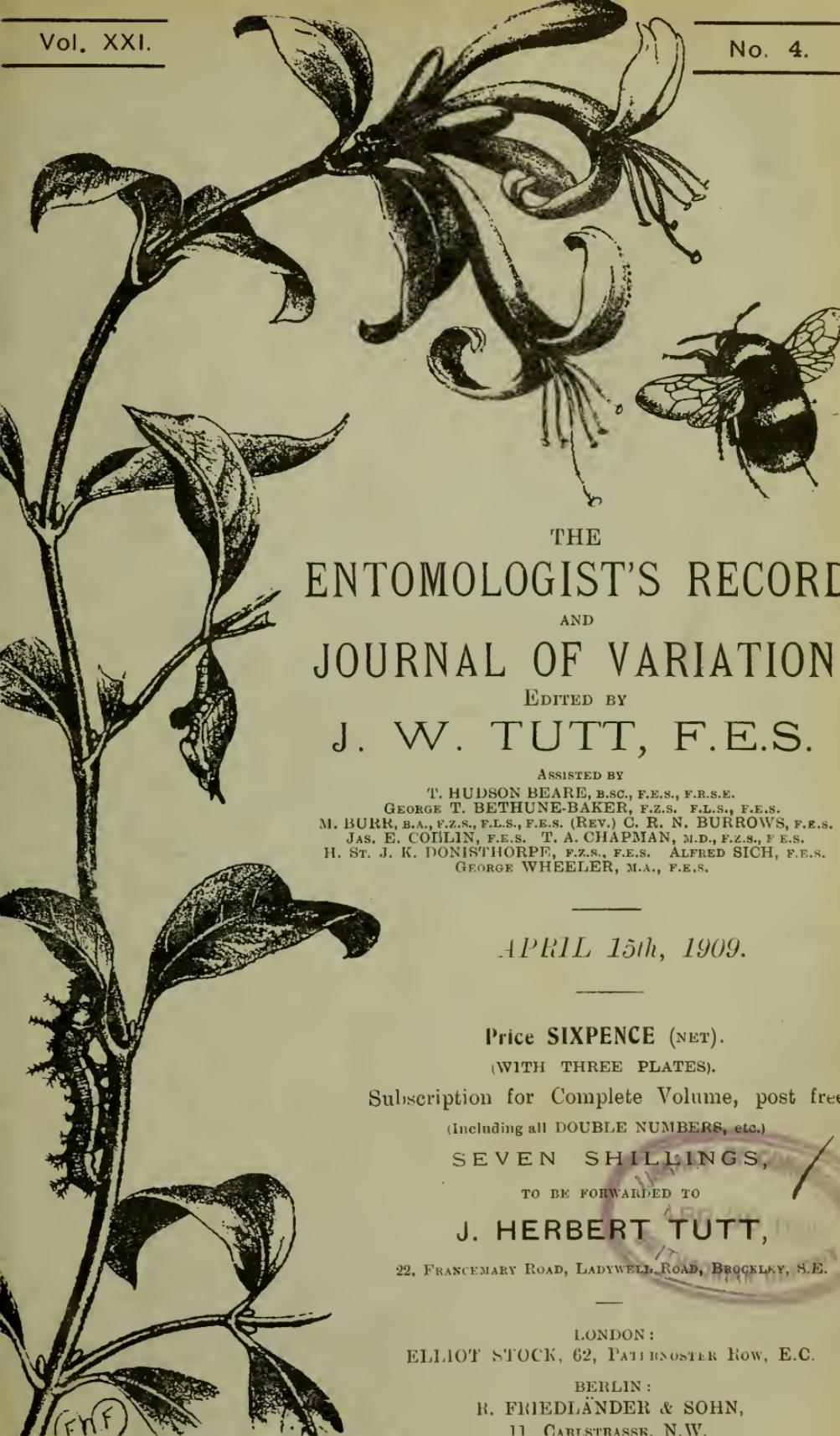
A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp. Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

APRIL 15th, 1909.

Price SIXPENCE (NET).

(WITH THREE PLATES).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYWELL ROAD, BROCKLEY, S.E.

LONDON:

ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,

11, CARLSTRASSE, N.W.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvae, and Pupæ, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order. } 5/-

Rannoch New Forest Shetland
16. vi. 97 4. ix. 97 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—Coleoptera: H. piceus, H. ruficollis, lineatocollis, H. piceipes, planus, A. nebulosus, A. sturmii, I. ater, obscurus, C. fuscus, D. marginalis, P. splendens, intermedius, H. oblongus, N. thoracica, G. vernalis, sylvatica, G. aurata, N. affine, Alphitobius (both), Tenebrio (both), C. cupreus (♂ s), P. coriarius (♀ s), D. semicuprea, comari, lemnae, C. auriolus, T. cylindricum. Desiderata.—C. campestris, C. nitens, G. mutator, C. pectinicornis, C. goettingensis, fastuosa, C. hypochebris, N. æneum, B. betuleti, specially *Ptilium* and *Trichius*.—F. Milton, 22, Granby Street, Bethnal Green, London, E.

Duplicates.—Edusa, Selene, Aglaia, C.-album, Galatea, Hyperanthus*, W.-album,

Artaxerxes (1), Bellargus, Lineola, Atropos (1 fair), S. ligustri, Tiliæ, Stellatarum, Porcellus, Geryon, Filipendulae, Lurideola, Caia*, Lubricipedæ, Lupulinus, Chrysorrhœa, Pndibunda*, Potatoria, Pavonia, Dictæa, Bucophala, Derasa, Ruminis, Ceruleocephala, Obsoleta, Putrescens, Comma, Impura, Pallens and red vars., Geminipuncta, Putris, Lithoxylea, Monoglypha, Brassicæ, Persicariæ, Didyma, Strigilis, Trigrammica, Morpheus, Suffusa, Segetum, Exclamationis, Ripæ, Cursoria, Præcox, Glareosa, Triangulum, Brunnea (good), *Festiva, Ianthina, Fimbria, Pronuba, Pyramidea, Gothicæ, Stabilis, Munda, Pistacina, Vaccinii, Fulvago, Trapezina vars., Oxyacantha var. capucina (1), Lucipara, Nebulosa, Dissimilis, Oleracea, Moneta, Gamma, Melanopa, Grisealis, Macularia, Pedaria, Abruptaria, Gemmaria, Biundularia, Obscuraria, Luteata, Candidata, Bisetata, Virgularia, Exanthemata, Atomaria, Ochrearia, Grossulariata, Defoliaria, Marginaria, Viridaria, Satyrata, Subnotata, Vulgata, Absinthiata, Togata (1), Bicolorata, Montanata, Dubitalis, Purpuralis, Perlellus, Heraclæana*. *Desiderata*.—Early stages of Lepidoptera, or will give free the more plentiful species of above to any beginner, on receipt of their postal box.—Lieut. J. J. Jacobs, R.E., St. Clair House, Payet Street, Gillingham, Kent.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.

WANTED.—Indian Theclas, Chrysophanids, and Lycænids. Offered—Palæarctic and Nearctic species.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro'.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] J. W. Tutt, 119, Westcombe Hill, Blackheath.

CHANGE OF ADDRESS.—Frederick J. Hanbury from Stainforth House, Upper Clapton, N.E., to "Brockhurst," East Grinstead.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W. 8 p.m. Meetings—May 5th; June 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings—May 3rd, Exhibition Meeting. Excursion—May 1st, Excursion to Hayes, Kent (2.25 p.m. train from Cannon Street).—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. April 22nd, "The Resting Positions of Butterflies and Moths" (Illustrated by lantern), Mr. A. E. Tonge. May 13th, "The Basingstoke Canal," Mr. E. Step.

North London Natural History Society, The Amherst Club, Amburst Road, N.—Meetings. April 17th, Excursion for "Sallowing" (Train leaves Liverpool Street 3 p.m. for Cheshunt); April 27th. May 11th, "Exhibition"; May 15th, Excursion to Bicket Wood district (Moorgate Street, 2.30 p.m., St. Pancras, 2.45 p.m. to Radlett Station); May 25th, "Mites" (second paper), Rev. C. R. N. Burrows.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

Dont Forget I DEAL IN GENUINE BRITISH ONLY.

Fertile Ova:—Versicolor, 3s.; Nubeculosa, 10s. 6d.; Lapponaria, 7s. 6d.; Prodromaria, 1s.; Carpinæ, 1s.; all per 50. **Larvæ**:—Paphia, 2s.; Adippe, 3s.; Villica, 1s. 6d.; Caja, 9d.; Syringaria, 1s. 6d. per dozen. **Pupæ**:—Machaon, 5s.; Elpenor, 2s. 6d.; Dictæa, 1s. 3d.; Ziczac, 1s. 3d.; Dictæoides, 5s.; Silaceaata, 2s. 6d.; Lacertula, 1s.; Falcula, 6d.; Jacobææ, 6d., per dozen.

FULL PRICE LIST FREE.

L. W. NEWMAN, F.E.S., Bexley, Kent.

Collectors who are commencing the Season's work should not fail to refer to **Practical Hints**, day by day, for information as to what can be done in the field every day in the year. Collectors who are going into a new locality, at home or abroad, will find the chapter in the new edition of Part I, "Holiday Collecting," particularly useful.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints* Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygænidæ. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising *Tephrosia bistortata* and *T. crepuscularia*. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palæarctic Psychides. Price 6d. net.

Catalogue of the Palæarctic Lachneides. Price 6d. net.

Catalogue of the Palæarctic Dimorphides, Bombycides, Brahmæides, and Attacides. Price 6d. net. These give all the family, tribal, generic, and specific names, as well as those of all named varieties and aberrations most useful for labelling.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

The Lasiocampids. Price 6d.

Philosophical aspects of Entomology. Price 1s.

The Study of Natural History—Variation and the Nature of Species. Price 1s.

Chortodes morrisii, Morris=C. bondii, Knaggs. Price 6d.

Nomenclature—Phylogeny—Synonymy. Price 6d.

A gregarious butterfly, *Erebia nerine*; with notes on the Lepidoptera of the Mendel Pass. Price 6d.

By other Authors.

Monograph of *Peronea cristana* and its aberrations. (Chromo-lithograph Plates.) By J. A. CLARK, F.E.S. Price 2s. net. A complete review of this polymorphic species, with all original descriptions and descriptions of new forms, and figures thereof.

The Variation of *Papilio machaon*, by W. Farren, F.E.S. Price 6d.

Protection and Mimicry as affecting the Coleoptera, by W. W. Fowler, M.A., F.E.S. Price 1s.

Collecting Noctuidæ by Lake Erie (with photograph), by A. Grote, M.A. Price 1s.

Mimicry in Insects, by Roland Trimen, F.R.S. Price 1s.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6 Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

- THE - QUITE NEW.

Ichneumons of Britain

VOL. I.

BY

CLAUDE MORLEY, F.E.S.

For 17s. 6d. Published recently at 26s. net.

A. H., 41, WISTERIA ROAD, LEWISHAM, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS
SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E..

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palæarctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (illustrated).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

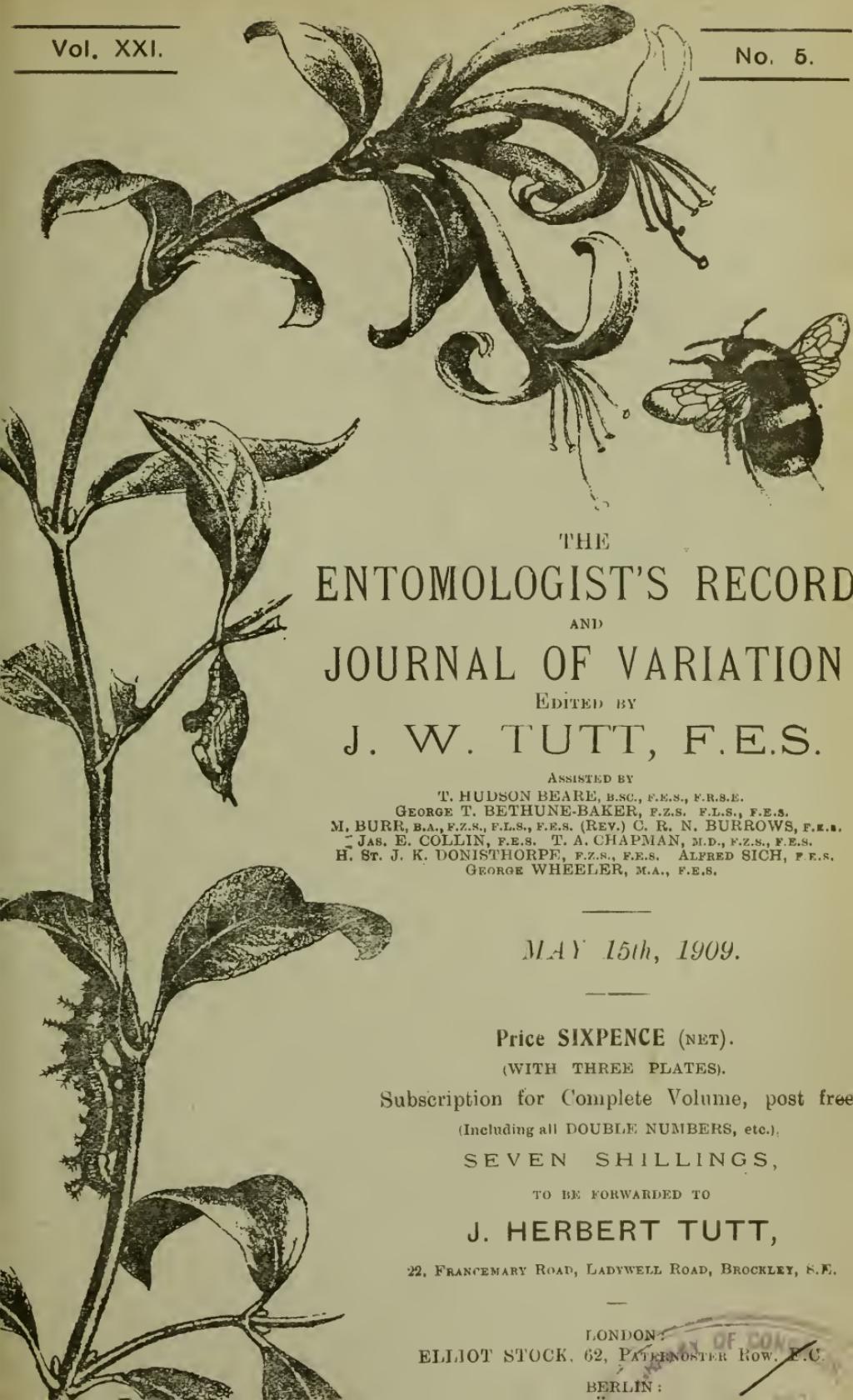
Monograph of the British Pterophorina. Demy 8vo., 161 pp. Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

MAY 15th, 1909.

Price SIXPENCE (NET).

(WITH THREE PLATES).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.).

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYWELL ROAD, BROMLEY, S.E.

LONDON: ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

*Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.*

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as received. Remittance in full must accompany each order. | 5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—
Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. BURR, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—*Lunigera*, *Humiliata*, *Cracca* (fair), red *Gracilis*,* *Monacha*,* *Desiderata*.—Wild larvae of *Caja* and pupæ of *Tiliæ*.—W. J. Ogden, 1, West Bank, Stamford Hill, London, N.

Duplicates.—Larvæ of *Leucographa* (from wild Dover females). *Desiderata*.—Very numerous, but pupæ or imagines (on black pins) only. No early stages. Will send marked list.—Captain P. A. Cardew, St. Aldwyns, Park Avenue, Dover.

Duplicates.—Ova of *Zonaria*; Larva of *Rurea*, *Festiva*, *Comes*, and *Repandata* (Yorks). *Desiderata*.—Larvæ or Pupæ.—W. G. Clutton, 132, Coal Clough Lane, Burnley, Lancs.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. —I can assist in nearly every branch—Entomological, Botanical, etc. —J. W. H. *Harrison, 181, Abingdon Road, Middlesboro', England.*

WANTED.—Indian Theclas, Chrysophanids, and Lycaenids. Offered—Palæarctic and Nearctic species.—J. W. H. *Harrison, 181, Abingdon Road, Middlesboro'.*

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] J. W. Tutt, 119, Westcombe Hill, Blackheath.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W. 8 p.m. Meetings—June 2nd. Next meeting not till October 6th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C. The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society., Hibernia Chambers, London Bridge. —The second and fourth Thursdays in each month, at 8 p.m. Meetings—May 27th, "Scotch Fir," by W. J. Lucas, F.E.S. June 10th, "Exhibition." Field Meetings—May 15th, Excursion to Holmwood. June 19th, to Mickleham Downs.

North London Natural History Society, The Amherst Club, Amburst Road, N.—Meetings—May 25th, "Mites" (second paper), Rev. C. R. N. Burrows, F.E.S. June 8th, "Catkins," Miss Nicholson. Field Meetings—May 15th, Excursion to Bicket Wood district (Moorgate Street, 2.30 p.m., St. Pancras, 2.45 p.m. to Radlett Station). June 19th, Woodriddon and Copthall (Liverpool Street, 2 p.m.).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

The South-eastern Union of Scientific Societies.—Annual Congress, June 9th-12th, 1909, at **Winchester**.—Members of Natural History Societies can obtain tickets for 3s.—Annual Address—Dukinfield H. Scott, M.A., Ph.D., F.R.S., Guildhall, Winchester, June 9th, 8.30 p.m. Papers every morning; Field excursions, every afternoon; Conversazione and Papers, every evening, from June 9th-12th. Tickets from Rev. R. Ashington Bullen, "Englemoor," Heathside Road, Woking, Surrey.

Dont Forget BRITISH ONLY STOCKED AT BEXLEY.

May and June Price List ready. If you send for one at once you are sure to find some you want.

Larvæ, per doz., Paphia, 1s. 6d.; Aglaia, 2s.; Adippe, 2s.; Sibylla, 1s. 6d.; Semela, 1s.; T. quercis, 1s. 6d.; Caja, 1s.; Dominula, 1s.; Gonostigma, 3s. 6d.; Quereifolia, 4s.; Carpini, 9d.; Vetusta, 1s.; Prunaria, 2s. 6d.; and many others. **Pupæ.**—S. andreniformis, 8s.; Bicuspid, 7s. 6d.; C. reticulata, 6s. each, and I guarantee every one, and will replace with fine set specimens any that fail to emerge or that produce ichneumons.

L. W. NEWMAN, F.E.S., Bexley, Kent.

The Migration and Dispersal of Insects.

By J. W. TUTT, F.E.S.

Demy 8vo., 132 pp. Price Five Shillings net.

This book, the only one published on this interesting subject, is of first importance to all students of the geographical distribution of animals, and contains the following chapters:—

1. General Considerations.
2. Coccids and Aphides.
3. Orthoptera.
4. Odonata.
5. Lepidoptera.
6. Coleoptera.
7. Diptera.
8. Social Insects—Hymenoptera, Termites.
9. Final considerations.

Only a small number of copies have been printed. It is trusted that all entomologists will, besides supporting the book themselves, recommend it to any libraries in which they are interested or with which they are connected.

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Collectors who are commencing the Season's work should not fail to refer to **Practical Hints**, day by day for information as to what can be done in the field every day in the year. Collectors who are going into a new locality, at home or abroad, will find the chapter in the new edition of Part I, "Holiday Collecting," particularly useful.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.
Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and forming a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints* Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygænidæ. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising Tephrosia bistortata and T. crepuscularia. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palæarctic Dimorphides, Bombycides, Brahmæides, and Attacides. Price 6d. net. These give all the family, tribal, generic, and specific names, as well as those of all named varieties and aberrations most useful for labelling.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

The Lasiocampids. Price 6d.

Philosophical aspects of Entomology. Price 1s.

The Study of Natural History—Variation and the Nature of Species. Price 1s.

Chortodes morrisii, Morris = C. bondii, Knaggs. Price 6d.

Nomenclature—Phylogeny—Synonymy. Price 6d.

A gregarious butterfly, Erybia nerine; with notes on the Lepidoptera of the Mendel Pass. Price 6d.

By other Authors.

Monograph of Peronea cristana and its aberrations. (Chromo-lithograph Plates.) By J. A. CLARK, F.E.S. Price 2s. net. A complete review of this polymorphic species, with all original descriptions and descriptions of new forms, and figures thereof.

The Variation of Papilio machaon. by W. Farren, F.E.S. Price 6d.

Protection and Mimicry as affecting the Coleoptera, by W. W. Fowler, M.A., F.E.S. Price 1s.

Collecting Noctuidæ by Lake Erie (with photograph), by A. Grote, M.A. Price 1s.

Mimicry in Insects, by Roland Trimen, F.R.S. Price 1s.

Influence of temperature on Insects, by Frederic Merrifield, F.E.S. Price 1s.

The utility of specific characters and physiological correlation, by Prof. R. Meldola, F.R.S. Price 1s.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

- THE - QUITE NEW.

Ichneumons of Britain

VOL. I.

BY

CLAUDE MORLEY, F.E.S.

For **15s. Od.** Published recently at 26s. net.

A. H., 41, WISTERIA ROAD, LEWISHAM, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palæarctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net. A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp.

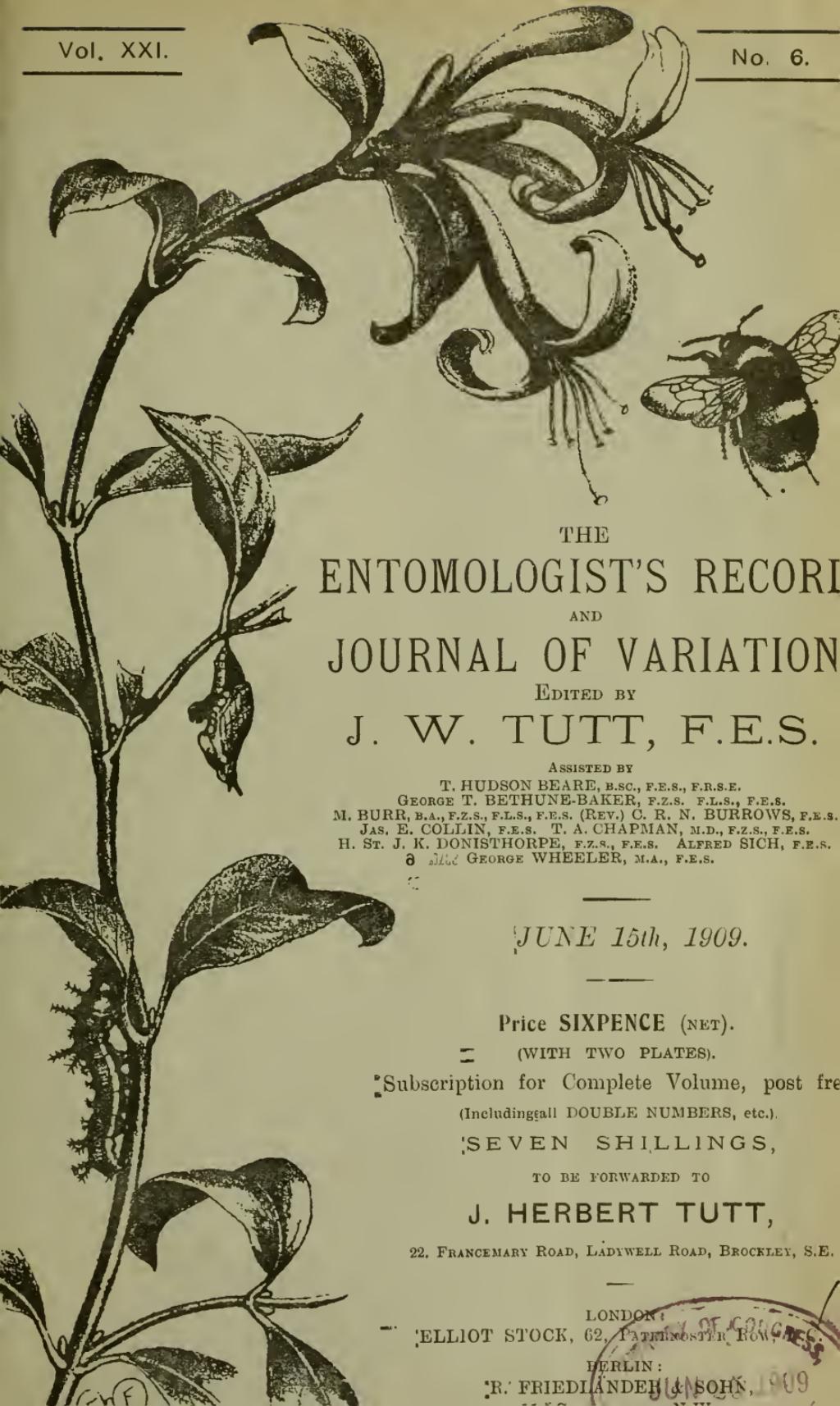
Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S. F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

JUNE 15th, 1909.

Price SIXPENCE (NET).

— (WITH TWO PLATES).

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.).

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22. FRANCEMARY ROAD, LADYWELL ROAD, BROCKLEY, S.E.

LONDON:

— ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

— BERLIN:

R. FRIEDLAENDER & SOHN, 1909

— NEW YORK:

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvae, and Pupæ, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as received. Remittance in full must accompany each order. } **5/-**

Rannoch New Forest Shetland
16. vi. 97 4. ix. 97 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road, Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

NOTICE.—Nos. 7 and 8 will be published together in one cover on July 15th. There will be, therefore, no number issued between July 15th and September 15th.

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Desiderata.—*Crambus salinellus*.—N. C. Rothschild, Arundel House, Kensington Palace Gardens, London, W.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.

WANTED.—Indian Theclas, Chrysopanids, and Lycaenids. Offered—Palæarctic and Nearctic species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'.*

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

CHANGE OF ADDRESS.—*W. J. Pether to 4, Willow Bridge Road, Canonbury, N.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W.. 8 p.m. Meetings—October 6th, 20th, etc.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Meetings—June 24th; July 8th; July 22nd; Exhibitions. Field Meetings—June 19th, Mickleham Downs; July 10th, Coombe Wood; July 24th, Reigate.

North London Natural History Society, The Amherst Club, Amhurst Road, N.—Meeting—June 22nd, "How the caterpillar escapes its enemies," A. Bacot, F.E.S. Field Meetings—June 19th, Woodriddien and Cothill (Liverpool Street, 2 p.m.). June 29th, Sugaring Expedition to Chingford (Liverpool Street, 6.30 p.m.).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

Dont Forget BRITISH ONLY STOCKED AT BEXLEY.

Healthy Larvæ.—Per doz., Nubeculosa, 10s. 6d.; Lapponaria, 6s.; Adippe, 3s. 6d.; Aglaia, 3s. 6d.; Paphia, 2s. 6d.; Sponsa, 4s.; Ridens, 2s. 6d.; Quercifolia, 4s.; T. erataegi, 2s. 6d.; Prodromaria, 1s.; many others.

Fertile Ova.—Bicuspid, 10s. 6d.; Myricæ, 9d.; E. extensaria, 2s. per doz.

Fine Pupæ.—Paphia, 3d.; Paphia bred from Valezina. 8d.; Aglaia, 5d.; Adippe, 5d.; Sibylla, 3½d.; Elpenor, 3d. Andreniformis, guaranteed to produce fine insects, 8s. each. Full list on receipt of P.C.

Have you got my New Relaxing Tin? If not you are without the greatest blessing to a collector, only 2s., postage 4d. You can keep insects in splendid relaxed condition for weeks and no mould.

L. W. NEWMAN, F.E.S., Bexley, Kent.

FOR SALE.

. . . A SUPERIOR MAHOGANY . . .

ENTOMOLOGICAL CABINET,

Of 40 Interchangeable Drawers.

Size 18in. by 16in. Camphor cell all round. Ebony knobs. Sunk panelled sides to carcase. Moulded top and plinth, and enclosed by half plate-glass panelled doors. Own make.

PRICE £40.

T. GURNEY, 50, The Broadway, London Fields, N.E.

FOR SALE

A few Z. ACHILLEÆ,

Taken in North Argyleshire.

For prices apply to **W RENTON**, Doune Road, Dunblane.

Collectors who are commencing the Season's work should not fail to refer to **Practical Hints**, day by day for information as to what can be done in the field every day in the year. Collectors who are going into a new locality, at home or abroad, will find the chapter in the new edition of Part I, "Holiday Collecting," particularly useful.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and forming a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on swallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygaenidae. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising *Tephrosia bistortata* and *T. crepuscularia*. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palaearctic Dimorphides, Bombycides, Brahmæides, and Attacides. Price 6d. net. These give all the family, tribal, generic, and specific names, as well as those of all named varieties and aberrations most useful for labelling.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

The Lasiocampids. Price 6d.

Philosophical aspects of Entomology. Price 1s.

The Study of Natural History—Variation and the Nature of Species. Price 1s.

Chortodes morrisii, Morris=C. bondii, Knaggs. Price 6d.

Nomenclature—Phylogeny—Synonymy. Price 6d.

A gregarious butterfly, *Erebia nerine*; with notes on the Lepidoptera of the Mendel Pass. Price 6d.

By other Authors.

Monograph of *Peronea cristana* and its aberrations. (Chromo-lithograph Plates.) By J. A. CLARK, F.E.S. Price 2s. net. A complete review of this polymorphic species, with all original descriptions and descriptions of new forms, and figures thereof.

The Variation of *Papilio machaon*, by W. Farren, F.E.S. Price 6d.

Protection and Mimicry as affecting the Coleoptera, by W. W. Fowler, M.A., F.E.S. Price 1s.

Collecting Noctuidæ by Lake Erie (with photograph), by A. Grote, M.A. Price 1s.

Mimicry in Insects, by Roland Trimen, F.R.S. Price 1s.

Influence of temperature on Insects, by Frederic Merrifield, F.E.S. Price 1s.

The utility of specific characters and physiological correlation, by Prof. R. Meldola, F.R.S. Price 1s.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/8, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/-. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (Brit'ish, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

- THE - QUITE NEW.

Ichneumons of Britain

VOL. I.

BY

CLAUDE MORLEY, F.E.S.

For **10s. 6d.** Published recently at 26s. net.

A. H., 41, WISTERIA ROAD, LEWISHAM, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Francemary Road, Ladywell Rcad, Brockley, S.E.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palaearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net. A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp. Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS OF Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

ARTICLES for insertion and EXCHANGES should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Keusington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

ARTICLES that require ILLUSTRATION are inserted on condition that the AUTHOR defrays the cost of the illustrations.

ALL EXCHANGE MAGAZINES must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

DUPLOCATES.—Carthami, Sao, Gordius, Mnemosyne, Euphenoides ♂ and ♀, Daphne, Aurinia, Phœbe, Cinxia, Didyma, Deione, Dictynna, Antiopa, Egeria, Pasiphaë. DESIDERATA.—Alcon, Meleager, Pheretes, Donzelii, Dolus, Callidice, Cynthia, Varia, Alcyone, Hermione and other Satyrs, Oeme, Ceto, Gorge, and many other European butterflies.—A. S. Tetley, 22, Avenue Road, Scarborough..

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.

WANTED.—Indian Theclas, Chrysopanids, and Lycaenids. Offered—Palæarctic and Nearctic species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'*.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—October 6th, 20th, etc.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Meetings—Sept. 23rd, "Our Authorities, pt. ii. An introduction to Entomological Literature," by H. J. Turner, F.E.S.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

Don't Forget BRITISH ONLY STOCKED AT BEXLEY.

Healthy Larvæ.—Per 25: Falcula, 1s.; Lacertula, 1s. 3d.; Ziezac, 1s. 3d.; Palpina, 1s. 3d.; Camelinæ, 1s.; Derasa, 1s. 6d.; S. populi, 1s. 6d.; Illustraria, 1s. 3d.; Illunaria, 9d.; Albicillata, 1s. 3d.; Silaceata, 1s. 6d.; P. napi, 1s.; Dictæcides, 6s.; Quercifolia, 1s. 3d.; Prunaria, 1s.; Prunaria (banded form), 1s. 3d.; Papilionaria, 1s. 6d.; Gonostigma, 1s. 6d.

Ova.—Per 50: Adippe, 1s. 6d.; Corydon, 1s. 3d.; Fuscantaria, 1s.; Angularia, 9d.; Crategi, 1s. 9d.; Box postage 2d. extra; many others.

L. W. NEWMAN, F.E.S., Bexley, Kent.

N.B.—Don't forget Newman's Wonderful Relaxing Tin, 2s. 4d. Post Free.

FOR SALE. PRICE £40.

... A SUPERIOR MAHOGANY ...

ENTOMOLOGICAL CABINET,

Of 40 Interchangeable Drawers.

Size 18in. by 16in. Camphor cell all round. Ebony knobs. Sunk panelled sides to carcase. Moulded top and plinth, and enclosed by half plate-glass panelled doors. Own make.

T. GURNEY, 50, The Broadway, London Fields, N.E.

FOR SALE.

A 14-DRAWER ENTOMOLOGICAL CABINET AND CONTENTS, consisting of

BRITISH LEPIDOPTERA

MOSTLY VARIETIES.

Also a number of Store-Boxes, Setting-Houses, &c., &c., and a quantity of Entomological literature.

PARTICULARS R. DUTTON, Fishergate, York.

Collectors who are commencing the Season's work should not fail to refer to **Practical Hints**, day by day for information as to what can be done in the field every day in the year. Collectors who are going into a new locality, at home or abroad, will find the chapter in the new edition of Part I, "Holiday Collecting," particularly useful.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.
Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage," "Instructions on the technical description of "Eggs," "Larva," "Pupa," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and forming a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopaedic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygaenidae. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising Tephrosia bistortata and T. crepuscularia. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palaearctic Dimorphides, Bombycides, Brahmæides, and Attacides. Price 6d. net. These give all the family, tribal, generic, and specific names, as well as those of all named varieties and aberrations most useful for labelling.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

The Lasiocampids. Price 6d.

Philosophical aspects of Entomology. Price 1s.

The Study of Natural History—Variation and the Nature of Species. Price 1s.

Chortodes morrisii, Morris—C. bondii, Knaggs. Price 6d.

Nomenclature—Phylogeny—Synonymy. Price 6d.

A gregarious butterfly, Erebia nerline; with notes on the Lepidoptera of the Mendel Pass. Price 6d.

By other Authors.

Monograph of Peronea cristana and its aberrations. (Chromo-lithograph Plates.) By J. A. CLARK, F.E.S. Price 2s. net. A complete review of this polymorphic species, with all original descriptions and descriptions of new forms, and figures thereof.

The Variation of Papilio machaon. by W. Farren, F.E.S. Price 6d.

Protection and Mimicry as affecting the Coleoptera, by W. W. Fowler, M.A., F.E.S. Price 1s.

Collecting Noctuidæ by Lake Erie (with photograph), by A. Grote, M.A. Price 1s.

Mimicry in Insects, by Roland Trimen, F.R.S. Price 1s.

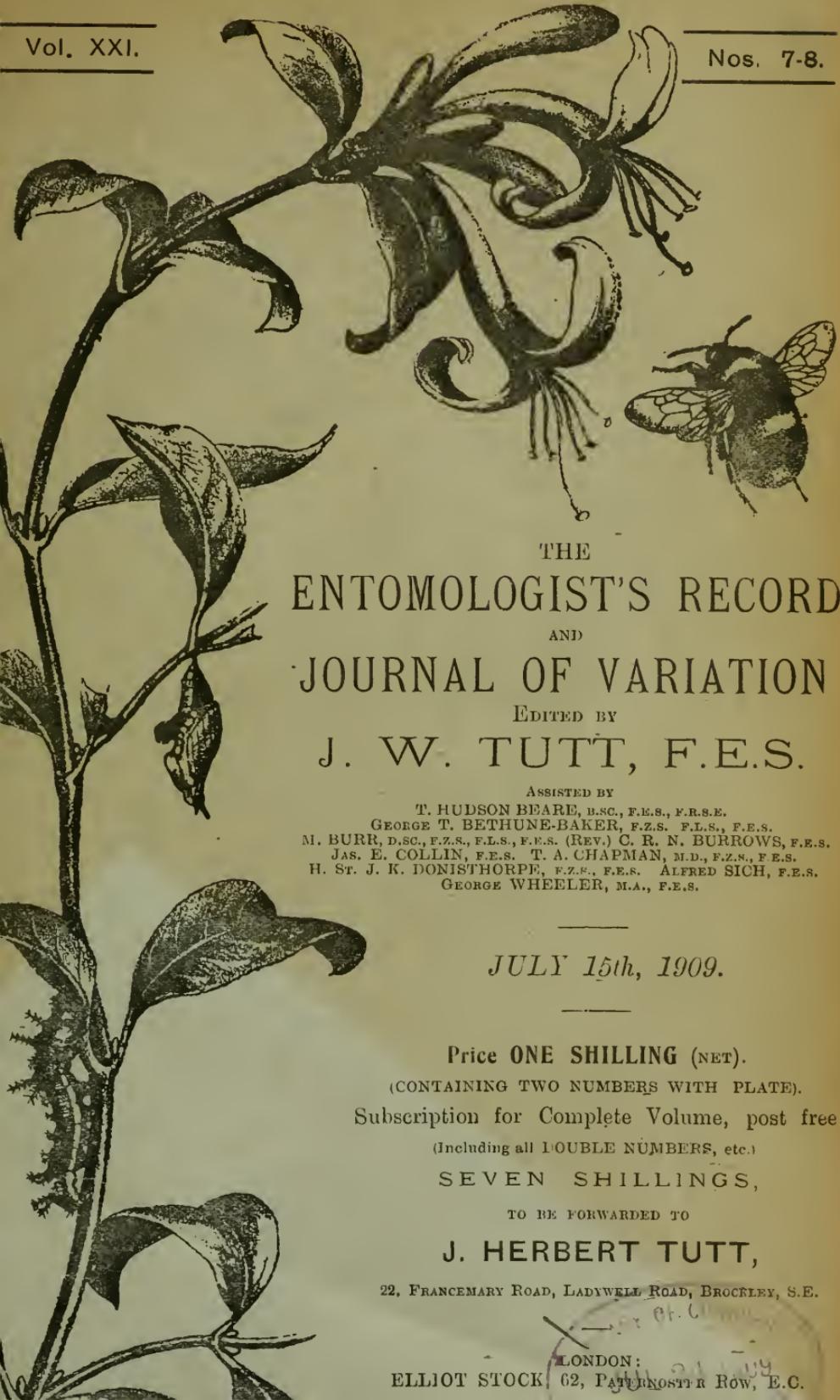
Influence of temperature on Insects, by Frederic Merrifield F.E.S. Price 1s.

The utility of specific characters and physiological correlation, by Prof. R. Meldola, F.R.S. Price 1s.

The next number will be issued on September 15th.

Vol. XXI.

Nos. 7-8.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY
T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

JULY 15th, 1909.

Price ONE SHILLING (NET).

(CONTAINING TWO NUMBERS WITH PLATE).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYWELL ROAD, BROCKLEY, S.E.

Pl. 6

LONDON:
ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

*Full List of Ova, Larvae, and Pupæ, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.*

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order. } **5/-**

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IYCRINE
TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

NOTICE.—Nos. 7 and 8 are herewith published together in one cover on July 15th. There will be, therefore, no number issued between July 15th and September 15th.

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Articles that require illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. Tutt, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Desiderata.—*Crambus salinellus*.—N. C. Rothschild, Arundel House, Kensington Palace Gardens, London, W.

Duplicates.—A few larvæ of *Smerinthus hybr. hybridus* (ocellata and populi). What offers in good species?—V. E. Shaw, 8, Moss Hall Grove, North Finchley.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.

WANTED.—Indian Theclas, Chrysopanids, and Lycenids. Offered—Palæarctic and Nearctic species.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro'.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] J. W. Tutt, 119, Westcombe Hill, Blackheath.

CHANGES OF ADDRESS.—C. P. Pickett to 28, Colworth Road, Leytonstone, Essex. V. E. Shaw to 8, Moss Hall Grove, North Finchley.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—October 6th, 20th, etc.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Meetings—July 22nd, Exhibition; August 12th, 26th Exhibition; Sept. 9th, "Seed Vessels," by H. Main, B.Sc.; Sept. 23rd, "Our Authorities, pt. ii. An introduction to Entomological Literature," by H. J. Turner, F.E.S. Field Meetings—July 24th, Reigate, Mr. A. Sich; Sept. 4th, Westerham, Mr. H. J. Turner.

North London Natural History Society, The Amherst Club, Amhurst Road, N.—(No notices received).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

Don't Forget BRITISH ONLY STOCKED AT BEXLEY.

Larvæ.—Per doz., Machaon, 3s.; Versicolor, 5s.; Bicuspid, 25s.; Dictæoides, 4s.; Ziczae, 1s.; Palpina, 9d.; Batis, 1s.; Orion, 1s. 6d.; Rumicis, 1s.; Croceago, 2s.; Orbicularia, 1s.; Silaceata, 1s.; E. extensaria, 7s. 6d.; Fluctuata (from grand selected Shetland parents), 3s. 6d.; many others.

Ova.—per 50, Paphia, 1s.; Aglaia, 1s.; Valezina, 2s.; Gonostigma, 1s. 3d.; Quercifolia, 1s. 3d.; Smaragdaria, 4s.; Dictæoides, 2s.; Dictæa, 1s.; Syringaria, 1s. 3d.; Prunaria, 1s.; Papilionaria, 2s. 3d.; also many others and Pupæ.

Write for lists, mention paper—

L. W. NEWMAN, F.E.S., Bexley, Kent.

N.B.—Don't forget Newman's Wonderful Relaxing Tin, 2s. 4d. Post Free.

FOR SALE.

Five 5s. size white wood airtight store boxes	..	..	..	3s. 0d. each.
Three 6s. size (ditto)	..	..	..	3s. 6d. each.
Two four-drawer glass-top white wood cabinets	..	..	..	5s. 0d. each.

Very good Condition.

**SLY,
Knoll Rd., SIDCUP.**

BARRETT'S

"Lepidoptera of The British Isles" (coloured plates).

STAINTON'S

"Natural History of Tineina."

HALF PRICE.

A few British P. dispar, L. euenosa, A. nubeculosa, etc.

A. F. FORD, "South View," Irving Road, BOURNEMOUTH.

"The Entomologist,"

1889, 1890, 1891, 1892. Unbound, clean.

1888-4, 1885-6, 1887-8. Each two years bound together.

"Entomologist's Record,"

Vols. II. & V. Unbound, clean. What offers?

SINCLAIR, 164, Trougate, Glasgow.

Collectors who are commencing the Season's work should not fail to refer to **Practical Hints**, day by day for information as to what can be done in the field every day in the year. Collectors who are going into a new locality, at home or abroad, will find the chapter in the new edition of Part I, "Holiday Collecting," particularly useful.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and forming a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on salving, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR.—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygaenidae. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising *Tephrosia bistortata* and *T. crepuscularia*. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palearctic Dimorphides, Bombycides, Brahmæides, and Attacides. Price 6d. net. These give all the family, tribal, generic, and specific names, as well as those of all named varieties and aberrations most useful for labelling.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

The Lasiocampids. Price 6d.

Philosophical aspects of Entomology. Price 1s.

The Study of Natural History—Variation and the Nature of Species. Price 1s.

Chortodes morrisii, Morris=C. bondii, Knaggs. Price 6d.

Nomenclature—Phylogeny—Synonymy. Price 6d.

A gregarious butterfly, *Erebia nerine*; with notes on the Lepidoptera of the Mendel Pass. Price 6d.

By other Authors.

Monograph of *Peronea cristana* and its aberrations. (Chromo-lithograph Plates.) By J. A. CLARK, F.E.S. Price 2s. net. A complete review of this polymorphic species, with all original descriptions and descriptions of new forms, and figures thereof.

The Variation of *Papilio machaon*, by W. Farren, F.E.S. Price 6d.

Protection and Mimicry as affecting the Coleoptera, by W. W. Fowler, M.A., F.E.S. Price 1s.

Collecting Noctuidæ by Lake Erie (with photograph), by A. Grote, M.A. Price 1s.

Mimicry in Insects, by Roland Trimen, F.R.S. Price 1s.

Influence of temperature on Insects, by Frederic Merrifield F.E.S. Price 1s.

The utility of specific characters and physiological correlation, by Prof. R. Meldola, F.R.S. Price 1s.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/l, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennae 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

- THE - QUITE NEW.

Ichneumons of Britain

VOL. I.

BY

CLAUDE MORLEY, F.E.S.

For 10s. 6d. Published recently at 26s. net.

A. H., 41, WISTERIA ROAD, LEWISHAM, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net.

The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net. A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuae and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera. Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

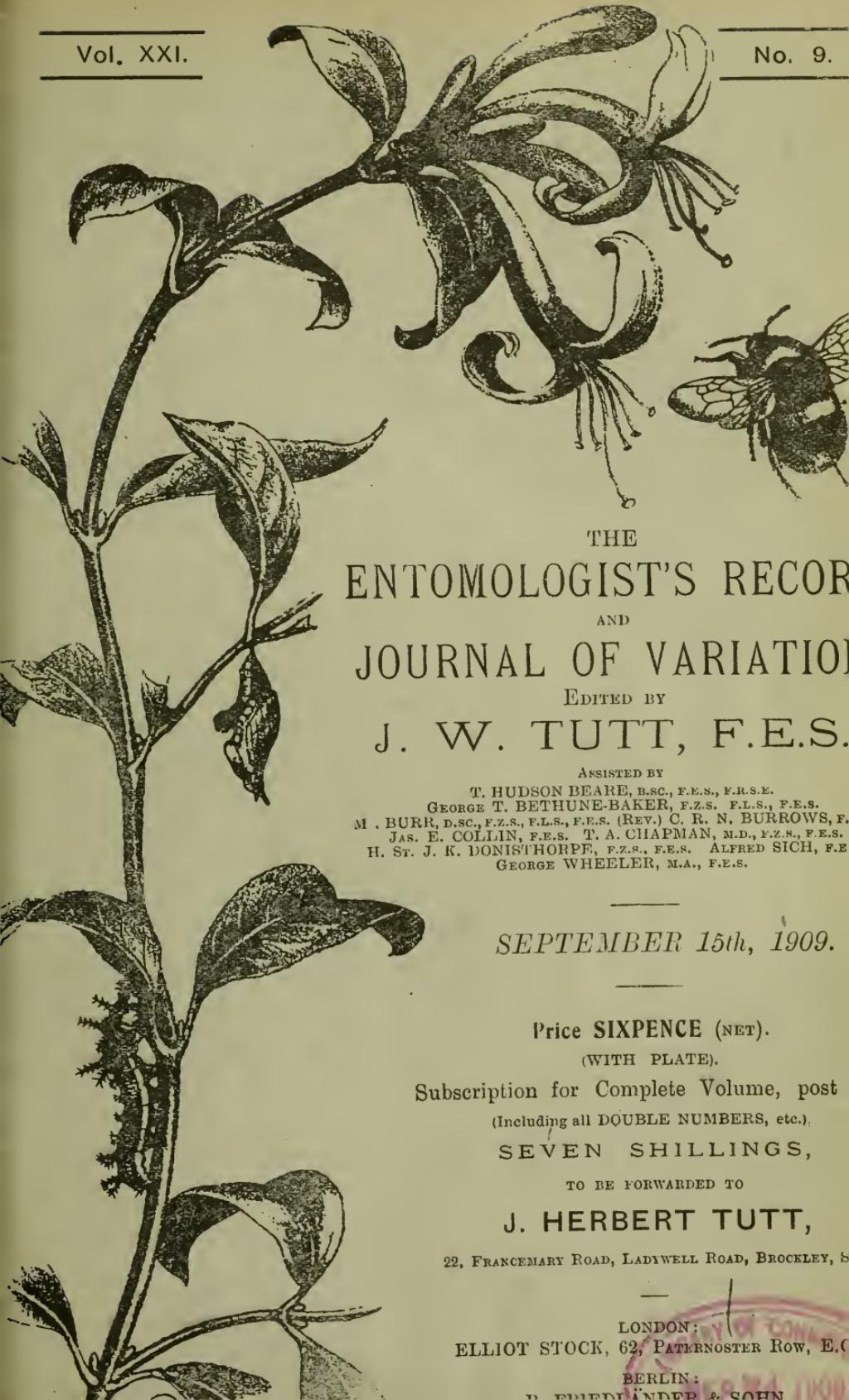
Monograph of the British Pterophorina. Demy 8vo., 161 pp. Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

SEPTEMBER 15th, 1909.

Price SIXPENCE (NET).

(WITH PLATE).

Subscription for Complete Volume, post
(Including all DOUBLE NUMBERS, etc.)
SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYWELL ROAD, BROCKLEY, S.

LONDON:
ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

R. ERIKSEN-ANDER & SOHN

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as received. Remittance in full must accompany each order. } 5/-

Rannoch 16. vi. 97 New Forest 4. ix. 97 Shetland 5. v. 97

ADDRESS.—“ Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. Page, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—Carthami, Sao, Gordius, Mnemosyne, Euphenoides ♂ and ♀, Daphne, Aurinia, Phœbe, Cinxia, Didyma, Deione, Dictynna, Antiopa, Egeria, Pasiphaë. Desiderata.—Alcon, Meleager, Pheretes, Donzelii, Dolus, Callidice, Cynthia, Varia, Alcyone, Hermione and other Satyrs, Oeme, Ceto, Gorge, and many other European butterflies.—A. S. Tetley, 22, Avenue Road, Scarborough..

Duplicates.—Grossulariata var. Varleyata, Acidalia strigilata, and other rarities. Desiderata.—Livornica, Celerio, Achillea, Ilicifolia, Musculosa, Extranea, Neurica (true), Palustris (female), Lucens, Crinanensis, Xerampelina var unicolor, Ocellaris, Satura, Ni, Fraxini, Fuliginaria, Roboraria (black var.), Innotata, Salicalis, Unionalis, Semirufa, Splendidella, Terebrella, Verrucella, Rubrotibiella, and fine varieties and local forms.—Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.

Desiderata.—Ova of *O. filigrammaria*.—*N. C. Rothschild, Arnndel House, Kensington Palace Gardens, W.*

Duplicates.—Ova of *P. saucia* (♀ of nigrocosta form).—*Capt. P. A. Cardew, St. Aldwyns Park Avenue, Dover.*

Duplicates.—Pupæ and Imagines of *Abruptaria** (black form). *Desiderata*.—Wild pupæ of *Tiliæ*.—*W. J. Ogden, 1, West Bank, Stamford Hill, London, N.*

Duplicates.—*Davus, Salicis*,* *Baia*,* *Festiva*,* *Chi* and *vars.*, *Rumicis*,* *Præcox*, *Capsincola*,* *Rurea** and *vars.*, *Tripartita*,* *Elutata**(*vars.*), *Strigillaria*, *Fumata*, *Cæsiata*, *Bidentata* and *vars.*, *Filigrammaria*,* *Repandata* (*vars.*), and *Impluviata* (dark). *Desiderata*.—Numerous to extend.—*W. G. Clutton, 132, Coal Clough Lane, Burnley, Lancs.*

WANTED.—Pupæ *S. Ligustri*, *Vinula*, *Trepida*, and many others. Liberal exchange or cash.—*L. W. Newman, Bexley, Kent.*

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.*

WANTED.—Indian *Theclas*, *Chrysopanids*, and *Lycenids*. Offered—Palaearctic and Nearctic species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'.*

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—October 20th, November 3rd, etc.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Nov. 1st, *Coral Reefs*. Lantern. A. M. Davies, D.Sc. Dec. 6th, *An Underground Excursion*. Lantern. T. W. Reader, F.G.S. Jan. 10th, President's Address. Excursions.—Oct. 23rd, 2.45 p.m., The Horniman Museum, Forest Hill.—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Meetings—Oct. 28th, *Diptera*, by W. H. Andrews, F.E.S. Nov. 11th, *Exhibition of Lantern Slides* (Members are kindly requested to bring anything interesting to exhibit by means of the Lantern). Nov. 25th, *Special Exhibition of Varieties* (will members please invite friends?).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

WANTED, a copy of **BUCKLER'S LARVÆ**.

Address, stating price, to **PERCY C. REID**, Feering Bury, Kelvedon.

THE

"CLARK COLLECTION" OF BRITISH LEPIDOPTERA.

Tuesday & Wednesday, Nov. 2nd & 3rd, at 1 o'clock.

Mr. J. C. STEVENS

Will Sell by Auction at his Rooms,

38, KING STREET, COVENT GARDEN, LONDON, W.C.

THE FIRST PORTION OF THE UNRIVALLED COLLECTION

Formed by the Late—

JOHN ADOLPHUS CLARK, Esq.,

M.P.S., L.D.S., Eng., F.E.S., etc.

Comprising extensive reared series, rare and extinct species, many unique and remarkable varieties, aberrations, local forms and hermaphrodites; all in the most perfect state of preservation, and representing the life work of the owner.

On view day prior and morning of Sale. Catalogues ready ten days prior to the Sale. May be had on application.

Collectors who are busy with autumnal work should not fail to refer to **Practical Hints**, day by day, for information as to what can be done in the field every day in the year. Collectors who are going into a new locality, at home or abroad, will find the chapter in the new edition of Part I, "Holiday Collecting," particularly useful.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and forming a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on swallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR.—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygaenidae. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising Tephrosia bistortata and T. crepuscularia. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Postal Orders to A. H., 41, Wisteria Road, Lewisham, S.E.

FOR SALE. PRICE £40.

. . . A SUPERIOR MAHOGANY . . .

ENTOMOLOGICAL CABINET,

Of 40 Interchangeable Drawers.

Size 18in. by 16in. Camphor cell all round. Ebony knobs. Sunk panelled sides to carcase. Moulded top and plinth, and enclosed by plate-glass panelled doors. Own make.

Also an Excellent **BINOCULAR MICROSCOPE** by Crouch, with mechanical stage, 2 eye-pieces, condenser, and 3 powers—2in., $\frac{1}{2}$ in., and $\frac{1}{4}$ in., in oak case.

Price 8 guineas.

T. GURNEY, 50, The Broadway, London Fields, N.E.

Don't Forget BRITISH ONLY STOCKED AT BEXLEY.

Fine Healthy Larvæ.—Prices per 25: Derasa, 2s.; Illustraria, 1s. 3d.; Ziczac, 1s. 3d.; Orbicularia, 2s. 6d.; Conflua, Shetlands, 3s. 6d.; Quercifolia, 1s. 6d.; Dominula, 1s.

Pupæ.—Per doz.: Chamomillæ, 6s.; Ridens, 4s. 6d.; Elpenor, 3s.; Tiliae, 3s. 6d.; Ocellatus, 3s. 6d.; Orbicularia, 1s. 6d.; P. napi, 9d.; Flavicornis, 1s. 9d.; Flavicornis Rannoch, 3s. Many others. Lists free.

Write at once for NEW PRICE LIST of Set Lepidoptera, just issued. Prices greatly reduced in many cases.

5s. Boxes of fine set insects, all on black pins and with data. A great bargain—worth 10s. at least.

L. W. NEWMAN, F.E.S., Bexley, Kent.

N.B.—Don't forget Newman's Wonderful Relaxing Tin, 2s. 4d. Post Free.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

- THE - QUITE NEW.

Ichneumons of Britain

VOL. I.

BY

CLAUDE MORLEY, F.E.S.

For 10s. 6d. Published recently at 26s. net.

A. H., 41, WISTERIA ROAD, LEWISHAM, S.E.

REISSUE OF

THE TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATONIS
SINGULARUM STIRPIUM LEPIDOPTERORUM, &c.

By JACOB HÜBNER

(1806).

This paper, one of the most important, and certainly one of the rarest, of those with which students of lepidoptera have to be conversant, has been reprinted from one of the only two known existing copies, and may be purchased, price 6d. (post free). Three copies for 1s.

Postal Order to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palæarctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net. A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (illustrated).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

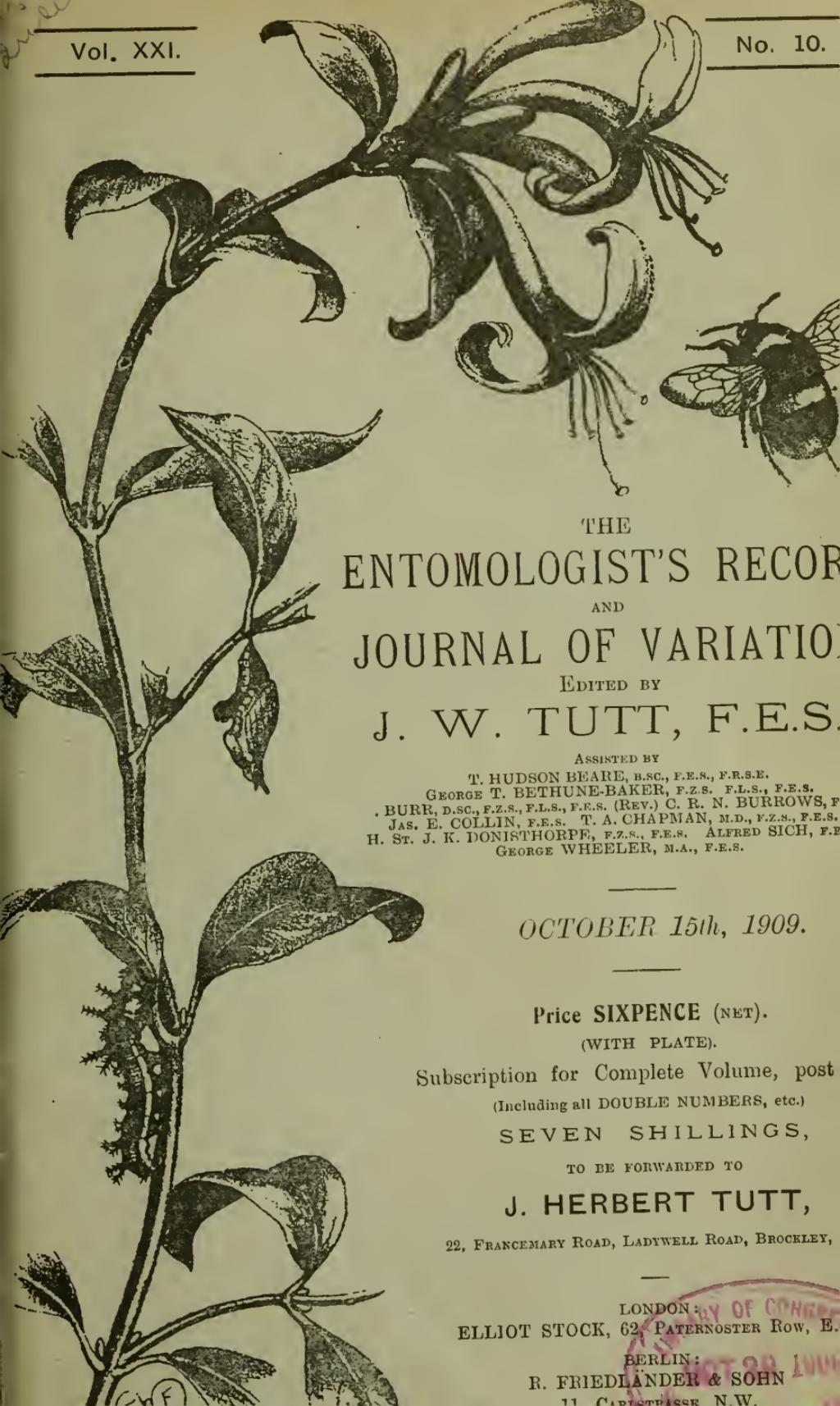
Monograph of the British Pterophorina. Demy 8vo., 161 pp. Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Orderer to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
. BURR, D.Sc., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

OCTOBER 15th, 1909.

Price SIXPENCE (NET).

(WITH PLATE).

Subscription for Complete Volume, post

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYWELL ROAD, BROCKLEY,

LONDON: ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN

11, CARLSTRASSE, N.W.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvae, and Pupæ, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as received. Remittance in full must accompany each order. } **5/-**

Rannoch 16. vi. 97 New Forest 4. ix. 97 Shetland 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road, Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARYÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES,

THEIR WORLD-WIDE VARIATION AND DISTRIBUTION.

By J. W. TUTT, F.E.S.,

The third volume of this important work is now nearing completion. It is still to be obtained in 1s. parts, a price that was fixed to bring, what might otherwise appear to be an expensive book, within the means of every lepidopterist. Only a limited number of copies are made up in parts, and as all parts remaining after the issue of the last are sent to the binder with the other sheets, they are practically unobtainable later. We have received so many applications for Vols. I and II in parts, since they have been completed, and customers do not seem to understand that the parts are only made up in about the numbers likely to be sold at the time and are not easily obtainable afterwards, that we think it advisable to publish this notice. We are always willing to supply any odd copies that we may happen to have in stock (through unequal sales) and will always try to make up customers' requirements, but cannot undertake to do so.

DEAR SIR,—

Please forward me Parts of *A Natural History of the British Butterflies, &c.*, at 1s. per part, for which I enclose Postal Order

Name.....

Address.....

Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group, and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net.

The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net. A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (illustrated). Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera. Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp. Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—
Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each.
Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. Tutt.

ADVERTISEMENTS of Books and Insects for Sale or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—*Grossulariata* var. *Varleyata*, *Acidalia strigilata*, and other rarities. *Desiderata*.—*Livornica*, *Celerio*, *Achilleæ*, *Ilicifolia*, *Musculosa*, *Extranea*, *Neurica* (true), *Palustris* (female), *Lucens*, *Crinauensis*, *Xerampelina* var. *unicolor*, *Ocellaris*, *Satura*, *Ni*, *Fraxini*, *Fuliginaria*, *Roboraria* (black var.), *Innotata*, *Salicalis*, *Unionalis*, *Semirufa*, *Splendidella*, *Terebrella*, *Verrucella*, *Rubrotibiella*, and fine varieties and local forms.—*Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.*

Desiderata.—Ova of *O. filigrammaria*.—*N. C. Rothschild, Arnndel House, Kensington Palace Gardens, W.*

Duplicates.—*Pupæ* and *Imagines* of *Abruptaria** (black form). *Desiderata*.—Wild pupæ of *Tiliæ*.—*W. J. Ogden, 1, West Bank, Stamford Hill, London, N.*

Duplicates.—Davus, Salicis,* Baia,* Festiva, *Chi and vars., Rumicis,* Præcox, Capsincola,* Rurea* and vars., Tripartita,* Elutata*(vars.), Strigillaria, Fumata, Cæsiata, Bidentata and vars., Filigrammaria,* Repandata (vars.), and Impluviata (dark). *Desiderata.*—Numerous to extend.—W. G. Clutton, 132, Coal Clough Lane, Burnley, Lancs.

Duplicates.—Cilialis, Inquinatellus, Margaritellus, Similana, Caledoniana, Hastiana, Variegana var., Conwayana, Sordidana, Dorsana (4), Fœneella (3), Angustana, Ustomaculana, and odd specimens of other species. *Desiderata.*—Very numerous, Deltoids, Pyralids, Crambids, Plumes, Tortrices, etc.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—Kühniella,* Fusca, Templi,* Viminalis* (black), Pulchrina, E. autumnaria,* Mundana*. *Desiderata.*—Numerous.—B. Morley, Wind Mill, Skelmanthorpe, nr. Huddersfield.

Duplicates.—Ægon (unicolorons dusky-black, and blue marked ♀s), Edusa, Argiolus, Corydon, U. comma, L. querulus, Batis, Derasa, Luctuosa, Promutata, Petrificata, Nigra, Lichenea, Glareosa, Lunosa, Ziczac, Pudibunda, Cardui, Semele. *Desiderata.*—Very numerous imagines and pupæ.—A. J. Spiller, Godolphin Cross, Helston.

WANTED.—To exchange freshunset southern forms of common insects with North Scotland collector for the same.—J. E. Eastwood, Eton, Witley, Surrey.

WANTED.—Pupæ S. Ligustri, Vinula, Trepida, and many others. Liberal exchange or cash.—L. W. Newman, Bexley, Kent.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—J. W. H. Harrison, 181, Abingdon Road, Middlesbrough, England.

WANTED.—Indian Theclas, Chrysophanids, and Lycaenids. Offered—Palæarctic and Nearctic species.—J. W. H. Harrison, 181, Abingdon Road, Middlesbrough.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British “Blues,” for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] J. W. Tutt, 119, Westcombe Hill, Blackheath.

CHANGE OF ADDRESS.—H. Wood, from 9, Church Road, Ashford, Kent, to “Elin,” Kennington, nr. Ashford, Kent.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—November 17th, December 1st, Discussion on “*Agriades coridon* and *A. thetis (bellargus)*,” opened by Mr. J. W. Tutt. Lantern Exhibition of Structural Affinities of these species, by Dr. T. A. Chapman. Fellows and other lepidopterists are kindly invited to make exhibitions of these species.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Dec. 6th, An Underground Excursion. Lantern. T. W. Reader, F.G.S. Jan. 10th, President’s Address.—Hon. Sec., Owen Monk, 8, Shooter’s Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society. Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Meetings—Nov. 25th, Special Exhibition of Varieties (Will members please invite friends?). Dec. 9th.—“Notes on Chrysopora hermannella,” by Mr. A. Sich, F.E.S.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

Don't Forget

BRITISH ONLY STOCKED AT BEXLEY.

Fine Healthy Pupæ.—Albulata, Shetlands, 2s. 6d. doz., 50, 7s. 6d.; Elpenor, 3s.; Tilia, 3s.; Illustraria, 1s. 3d.; Albicillata, 1s. 3d.; Derasa, 1s. 9d.; Flavicornis, Rannoch, 2s. 6d.; Lacertula, 1s.; Silaceaata, 2s. 6d.; and many others.

Newman’s Relaxing Tins now made in two sizes:—9" x 9", 3s. 6d. each, postage 5d.; and as before, 4½" x 6", 2s. each, postage 4d. The large size is very useful.

FULL WINTER PRICE LIST NOW READY.

L. W. NEWMAN, F.E.S., Bexley, Kent.

Collectors who are busy with autumnal and winter work should not fail to refer to **Practical Hints**, day by day, for information as to what can be done in the field every day in the year.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.
Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage," Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc. etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and forming a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

.....
To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

THE
"CLARK COLLECTION" OF BRITISH LEPIDOPTERA.
Tuesday & Wednesday, Dec. 7th & 8th, at 1 o'clock.

Mr. J. C. STEVENS

Will Sell by Auction at his Rooms,

38, KING STREET, COVENT GARDEN, LONDON, W.C.,

THE SECOND PORTION OF THE UNRIVALLED COLLECTION

Formed by the Late—

JOHN ADOLPHUS CLARK, Esq.,

M.P.S., L.D.S.Eng., F.E.S., etc.

Comprising extensive reared series, rare and extinct species, many unique and remarkable varieties, aberrations, local forms and hermaphrodites; all in the most perfect state of preservation, and representing the life work of the late owner.

On view day prior (10 to 4) and morning of Sale. Catalogues on application.

The Migration and Dispersal of Insects.

By J. W. TUTT, F.E.S.

Demy 8vo., 132 pp. Price Five Shillings net.

This book, the only one published on this interesting subject, is of first importance to all students of the geographical distribution of animals, and contains the following chapters:—

1. General Considerations. 2. Coccids and Aphides. 3. Orthoptera. 4. Odonata. 5. Lepidoptera. 6. Coleoptera. 7. Diptera. 8. Social Insects—Hymenoptera, Termites. 9. Final considerations.

Only a small number of copies have been printed. It is trusted that all entomologists will, besides supporting the book themselves, recommend it to any libraries in which they are interested or with which they are connected.

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygaenidae. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

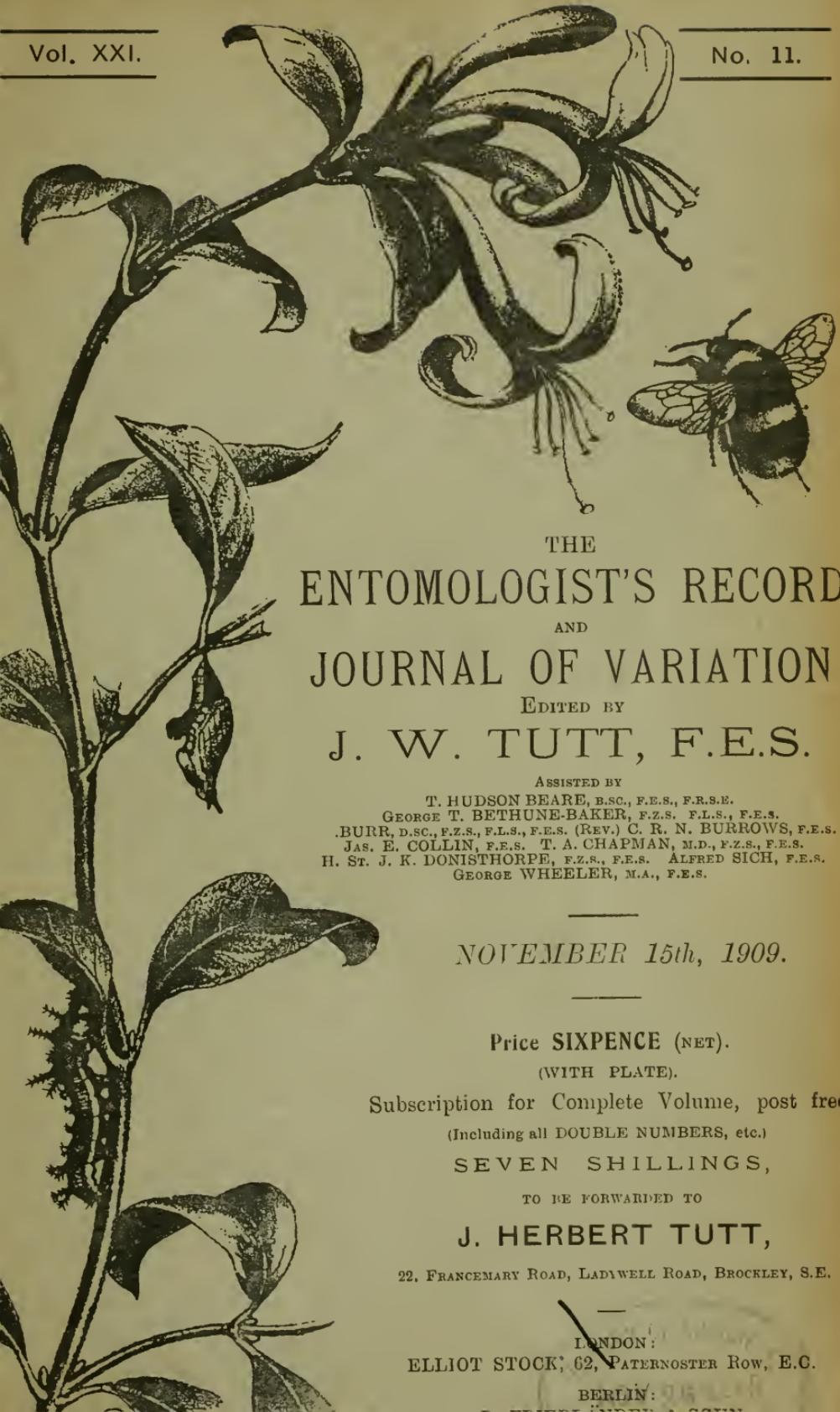
Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising Tephrosia bistortata and T. crepuscularia. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
.BURR, D.Sc., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

NOVEMBER 15th, 1909.

Price SIXPENCE (NET).

(WITH PLATE).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYWELL ROAD, BROCLEY, S.E.

LONDON:

ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

D. REINHOLD, KARLSBAD, S. GERM.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as received. Remittance in full must accompany each order. } **5/-**

Rannoch New Forest Shetland
16. vi. 97 4. ix. 97 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road, Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

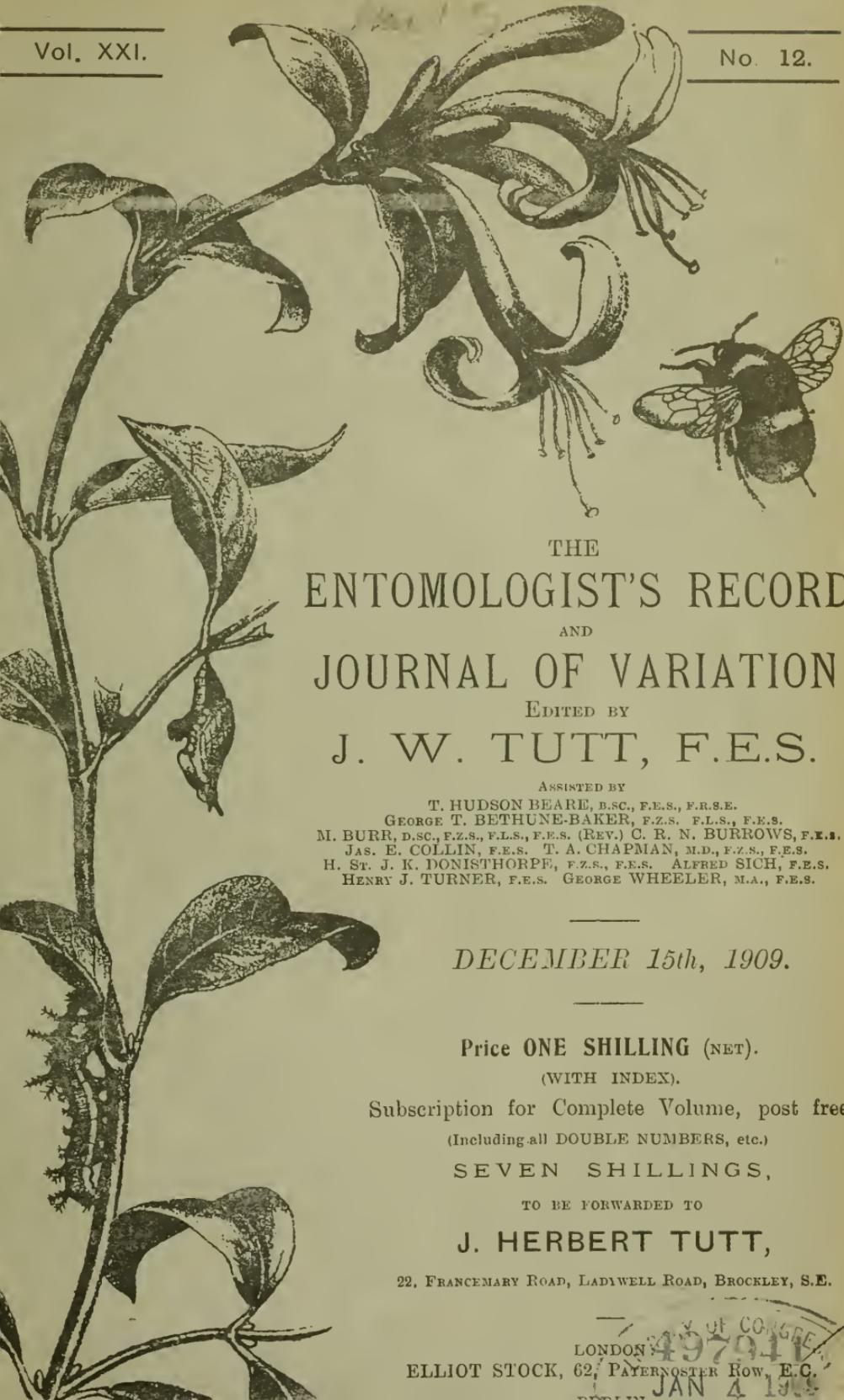
For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

Subscriptions for Vol. XXII are now due.

Vol. XXI.

No. 12.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS, F.E.S.
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
HENRY J. TURNER, F.E.S. GEORGE WHEELER, M.A., F.E.S.

DECEMBER 15th, 1909.

Price ONE SHILLING (NET).

(WITH INDEX).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADIWELL ROAD, BROCKLEY, S.E.

LONDON 497916
JAN 4 1909
ELLiot STOCK, 62, PATERNOSTER ROW, E.C.
PRINTED IN ENGLAND

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

(As supplied to the British Museum.)

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000 { To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order. } 5/-

Rannoch 16. vi. 97 New Forest 4. ix. 97 Shetland 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

LIVING MADE EASY

There is a tendency in many departments of life towards greater simplicity. The aim of the most enlightened civilisation is really to make life less complex, less strenuous, and less unsatisfactory. BEECHAM'S PILLS are thoroughly modern in this respect, for their unfailing effect is to cure those disorders of the Stomach, Liver, and Bowels, which so greatly increase the measure of our troubles and difficulties. Existence which, under the evil spell of ill-health, may appear hard and gloomy, will become bright and pleasant

BY TAKING

BEECHAM'S PILLS. However much human ingenuity may do to make life less of a struggle the man who is suffering from any derangement of the digestive organs will always find living a heavier burden than he would otherwise do. To him life will always be more of a painful duty than a delight. It is, indeed, a mystery why he should continue to allow dyspepsia, biliousness, disordered liver, sluggish kidneys, and the accompanying loss of nerve-power to overshadow his happiness, when a certain remedy for all his troubles is to be found in

BEECHAM'S PILLS

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXII (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1910.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrrose," Gellatly Road, Hatcham, S.E.

The Back Volumes (I-XX) of the *Ent. Record*, &c., can be obtained as follows—Single volumes, 7s. 6d.; 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, 16, 17, 18, 19, 20 vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XIX, sold separately, price 1s. 6d. each.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS OF Books and Insects for Sale or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Dr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—*Io*,* *Elymi*,* *Suasa*,* *Rumicis*,* *Brunnea*,* *Saucia*, *Lunigera* (fair), *Craccae* (4), *Nigra*, *Ianthina*,* *Chi*, *Graminis*, *Captiuncula*, *Fulva*, *Sylvinus*, *Spadicea*, *Hectus*, *Glareosa*, *Macilenta*, *Ambigua*, *Unanimis*, *Lunaria*,* *Caesiata*, *Cervinata*,* *Tiliaria*,* *Badiata*,* *Prunaria*, *Russata*,* *Isogrammata*,* *Succenturiata*,* *Mendica*,* *Lignata*, *Subfulvata*,* *Bicolorata* and var. *Plumbata*, *Olivata*, *Cambrica*, *Fluviata*, *Trifasciata*,* *Propugnata*, *Affinitata*, *Ophthalmicana*, *Kühniella*, *Cilialis*, *Sordidana*, *Bimaculana*, *Inquinatellus*, etc. *Desiderata*.—*Tiliae* (pupæ), *Betula*, *Bombyliformis* (narrow), *Ligniperda*, *Tincta*, *Cassinea* ♀s, *Obelisca*, *Brevilinea*, *Muscerda*, *Simulata*, *Glabraria*, *Curzoni*, *Punctaria*, *Emutaria*, and many others including to end of Tortrices.—T. Ashton Lofthouse, *The Croft, Linthorpe, Middlesborough*.

Desiderata.—Ova of *O. filigrammaria*.—*N. C. Rothschild, Arundel House, Kensington Palace Gardens, W.*

Duplicates.—Pupæ and Imagines of *Abruptaria** (black form). *Desiderata.*—Wild pupæ of *Tiliæ*.—*W. J. Ogden, 1, West Bank, Stamford Hill, London, N.*

Duplicates.—*Davus, Salicis.** *Baia, Festiva, Chi and vars., Ruminis, Präcox, Capsincola, Kureta** and vars., *Tripartita, Elutata** (vars.), *Strigillaria, Fumata, Cæsiata, Bidentata* and vars., *Filigrammaria, Repandata* (vars.), and *Impluviata* (dark). *Desiderata.*—Numerous to extend.—*W. G. Clutton, 132, Coal Clough Lane, Burnley, Lancs.*

Duplicates.—*Kühniella, Fusca, Templa, Vininalis** (black). *Pulchrina, E. autumnaria, Mundana**. *Desiderata.*—Numerous.—*B. Morley, Wind Mill, Skelmanthorpe, nr. Huddersfield.*

Duplicates.—*Egon (unicolorons* dusky-black, and blue-marked ♀'s), *Edusa, Argiolus, Corydon, U. comma, L. quercus, Batis, Derasa, Luctuosa, Promutata, Petrifacata, Nigra, Lichenea, Glareosa, Lunosa, Ziezae, Pubibunda, Cardui, Semele. Desiderata.*—Very numerous imagines and pupæ.—*A. J. Spiller, Godolphin Cross, Helston.*

WANTED.—To exchange fresh sunset southern forms of common insects with North Scotland collector for the same.—*J. E. Eastwood, Enton, Witney, Surrey.*

WANTED.—Pupæ *S. Ligustris, Vinula, Trepida*, and many others. Liberal exchange or cash.—*L. W. Newman, Bexley, Kent.*

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.*

WANTED.—Indian *Theclas, Chrysopanids*, and *Lycenids*. Offered—Palaearctic and Nearctic species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'.*

WANTED.—Good photographs or careful drawings of Aberrations, *Gynandromorphs*, etc., of any British “Blues,” not yet treated for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.]—*J. W. Tutt, 119, Westcombe Hill, Blackheath.*

WANTED.—For breeding experiments in heredity and sex-determination, pupæ of *Spilosoma mendica* and its (Irish) var. *rustica*.—*L. Doncaster, Zoological Laboratory, University, Birmingham.*

WANTED.—Larvæ of pupæ of *Crabroniformis* and *Bembeciformis*.—*N. Charles Rothschild, Arundel House, Kensington Palace Gardens, London, W.*

CHANGES OF ADDRESS.—*Capt. P. A. Carden to 50, Melbury Gardens, Cottenham Park, Wimbledon. G. O. Sloper to South Kensington Hotel, Queen's Gate Terrace, S.W. H. Willoughby Ellis to “Holly Hill,” Berkswell, Warwickshire.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—January 19th (Annual Meeting).

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Jan. 10th, President's Address.—Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

The South London Entomological and Natural History Society., Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Meetings—January 13th, 27th.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

Don't Forget

BRITISH ONLY STOCKED AT BEXLEY.

Fine Healthy Pupæ.—*Albulata, Shetlands, 2s. 6d. doz., 50, 7s. 6d.; Elpenor, 3s.; Tiliæ, 3s.; Illustraria, 1s. 3d.; Albicillata, 1s. 3d.; Derasa, 1s. 9d.; Flavicornis, Rannoch, 2s. 6d.; Lacertula, 1s.; Silacea, 2s. 6d.; and many others.*

Newman's Relaxing Tins now made in two sizes:—9" x 9", 3s. 6d. each, postage 5d.; and as before, 4½" x 6", 2s. each, postage 4d. The large size is very useful.

FULL WINTER PRICE LIST NOW READY.

L. W. NEWMAN, F.E.S., Bexley, Kent.

Collectors who are busy with winter work should not fail to refer to **Practical Hints**, day by day, for information as to what can be done in the winter to their collections, apparatus, etc., as well as in the field every day in the year.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvae," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and forming a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopedic from the field lepidopterist's point of view; nothing so complete as the hints on swallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

PHILIPPINE ISLANDS.

Gentleman travelling in these Islands will be glad to make collections of insects for such as desire.

For Terms apply

A. A. JACKSON,

5, Thistle Street, Edinburgh.

The Migration and Dispersal of Insects.

By J. W. TUTT, F.E.S.

Demy 8vo., 132 pp. Price Five Shillings net.

This book, the only one published on this interesting subject, is of first importance to all students of the geographical distribution of animals, and contains the following chapters:—

1. General Considerations. 2. Coccids and Aphides. 3. Orthoptera. 4. Odonata, 5. Lepidoptera. 6. Coleoptera. 7. Diptera. 8. Social Insects—Hymenoptera, Termites. 9. Final considerations.

Only a small number of copies have been printed. It is trusted that all entomologists will, besides supporting the book themselves, recommend it to any libraries in which they are interested or with which they are connected.

Melanism and Melanochroism in British Lepidoptera

(Demy 8vo., bound in Cloth. Price 5/-.)

Deals exhaustively with all the views brought forward by scientists to account for the forms of melanism and melanochroism; contains full data respecting the distribution of melanic forms in Britain, and theories to account for their origin; the special value of "natural selection," "environment," "heredity," "disease," "temperature," &c., in particular cases. Lord Walsingham, in his Presidential address to the Fellows of the Entomological Society of London, says, "An especially interesting line of enquiry as connected with the use and value of colour in insects is that which has been followed up in Mr. TUTT's series of papers on 'Melanism and Melanochroism.'"

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Entomological Pamphlets, etc.,

By J. W. TUTT, F.E.S.

Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera. Price 1s. 6d. Reviewing the oval, larval, pupal, and imaginal characters used by various Lepidopterists.

Notes on the Zygaenidae. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising Tephrosia bistortata and T. crepuscularia. Price 6d. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennae 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES,

THEIR WORLD-WIDE VARIATION AND DISTRIBUTION.

By J. W. TUTT, F.E.S.,

The third volume of this important work has now been completed. It is still to be obtained in 1s. parts, a price that was fixed to bring, what might otherwise appear to be an expensive book, within the means of every lepidopterist. Only a limited number of copies are made up in parts, and as all parts remaining after the issue of the last are sent to the binder with the other sheets, they are practically unobtainable later. We have received so many applications for Vols. I and II in parts, since they have been completed, and customers do not seem to understand that the parts are only made up in about the numbers likely to be sold at the time and are not easily obtainable afterwards, that we think it advisable to publish this notice. We are always willing to supply any odd copies that we may happen to have in stock (through unequal sales) and will always try to make up customers' requirements, but cannot undertake to do so.

DEAR SIR,—

Please forward me Parts of *A Natural History of the British Butterflies, &c.*, at 1s. per part, for which I enclose Postal Order

Name.....

Address.....

Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

Back volumes of

The Entomologist's Record & Journal of Variation

(Vols. I-XX).

Single back volumes of the above can be obtained at 7s. 6d. per volume; any two or three volumes at 7s. 3d. per volume; four, five, six, seven, eight or nine at 7s. per volume; ten, eleven, twelve, thirteen or fourteen at 6s. 9d. per volume; fifteen, sixteen, seventeen, eighteen, nineteen or twenty at 6s. 6d. per volume. Back copies of the Magazine at double the published price (plus postage). Special Indexes, Vols. III-XIX, price 1s. 6d. each.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I, II and III. Price one guinea each net. Vol. IV will be commenced shortly (Monthly parts, 1/-). [Subscription to include 20 parts, 17s. 6d.]

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palaeartic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (illustrated).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII, IX and X, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 8 vols., £6 net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net. A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (illustrated).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera. Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp. Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

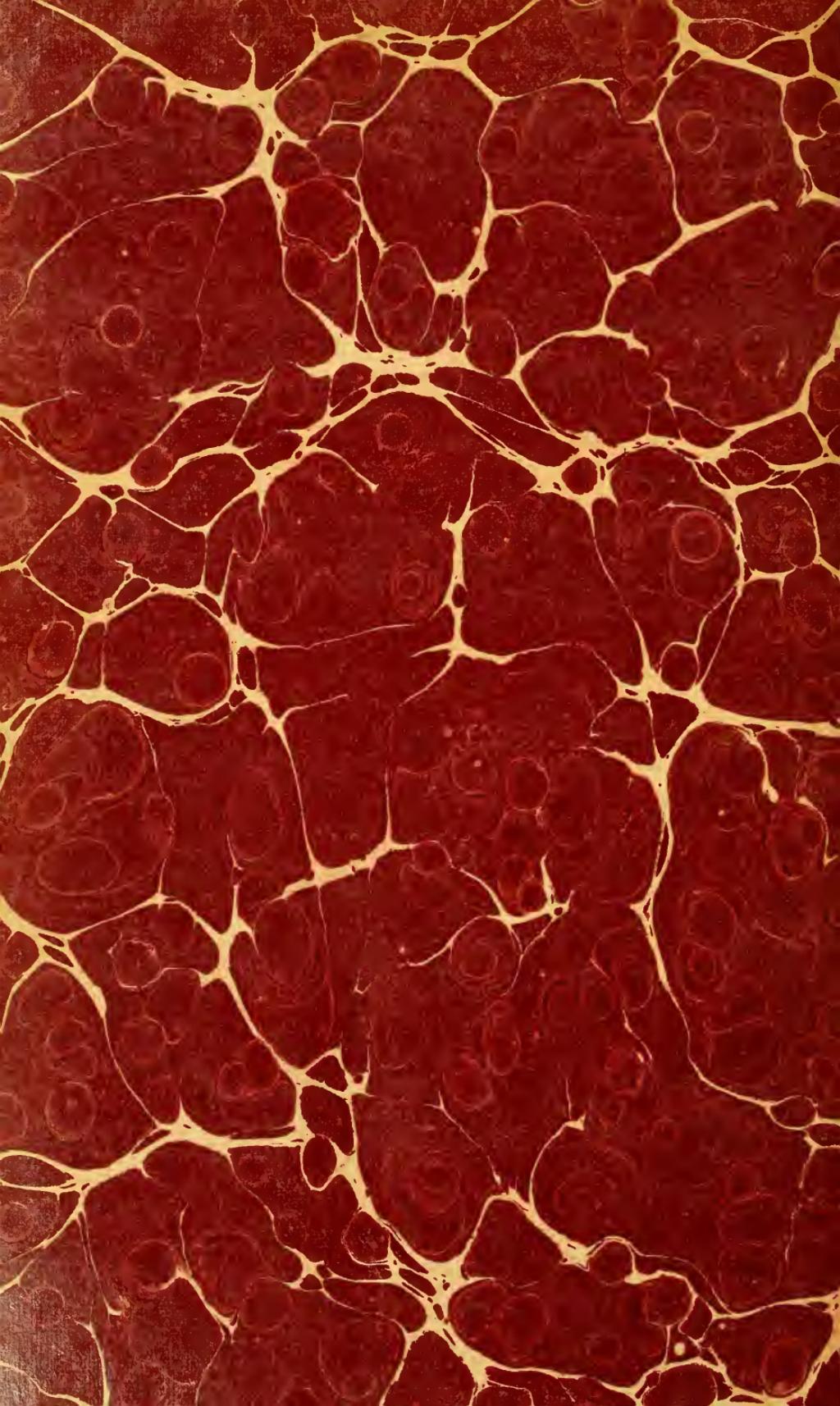
Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road,

LONDON, S.E.



Sept. 21, 1909

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00908 3734